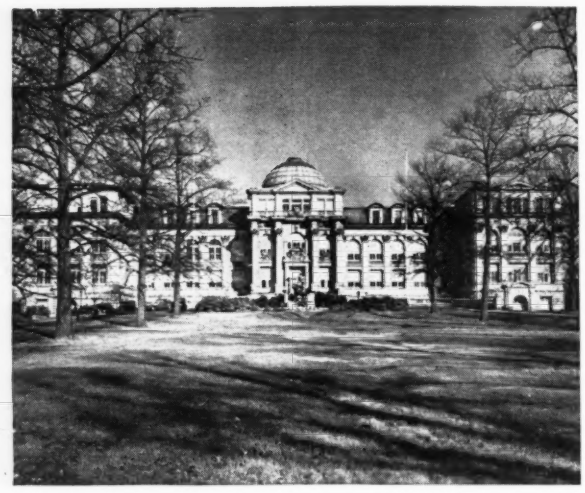
# THE GARDEN JOURNAL

OF THE NEW YORK BOTANICAL GARDEN

Vol. 7, No. 4 July-August, 1957



Fall term, Educational Program of The New York Botanical Garden opens on September 11, 1957

1957-58 Fall-Winter Series of Free Saturday Afternoon Lecture Program starts October 5, 1957

Annual Children's Flower Arrangement Competition in cooperation with the Board of Education, Office of Nature Study and School Gardens, City of New York, October 26, 1957

Theater Benefit, sponsored by Volunteer Associates of The New York Botanical Garden, January 8, 1958—"The Music Man."

**THE GARDEN JOURNAL**

**of The New York Botanical Garden**

DOROTHY EBEL HANSELL
*Editor*

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**AMONG OUR CONTRIBUTORS**

The Garden Club of America honored DR. WILLIAM J. ROBBINS, Director of The New York Botanical Garden, at its recent annual meeting, presenting him with the Eloise Payne Luquer Medal, see page 136 of this issue . . . A newspaperman with a hobby describes A. D. ROTHMAN, who specializes in fine lilies at Strawberry Hill, Rhinebeck, New York . . . DR. CYNTHIA WESTCOTT, well-known plant doctor, lecturer, and author, participated in the Fifteenth Annual Rose Day at The New York Botanical Garden . . . T. H. EVERETT is Curator of Education and Horticulturist of The New York Botanical Garden . . . SILVIA SAUNDERS, daughter of the late Dr. A. P. Saunders, is carrying on the family nursery at Clinton, New York, which specializes in Saunders' hybrid peonies . . . PAUL L. SANDAHL is Superintendent of the Park Department of Des Moines, Iowa . . . ROSE B. WHITE is a keen amateur gardener from San Rafael, California . . . As principal botanist and assistant head of the Plant Exploration and Introduction Division, United States Department of Agriculture during 1953-55, DR. W. H. HODGE supervised the bamboo program. Although he is now head of the Department of Education and Research at Longwood Gardens, Kennett Square, Pennsylvania, his interest in bamboo continues and as an active collaborator of the U.S.D.A. some phases of his former bamboo work still go on. Dr. Hodge has traveled extensively in Central and South America as well as in North America . . . While on a botanical trip to Brazil in December 1956, DR. JOHN J. WURDACK of the Garden's taxonomic staff spent several days in Santarém along with Dr. Pires and Dr. Black of the Instituto Agronomico do Norte. He visited the statue and plaque erected by the nineteenth century botanist, von Martius . . . GERTRUDE B. FOSTER is editor of Herb Grower Magazine.

**CREDIT FOR ILLUSTRATIONS**

We are indebted to the Display Committee—Mrs. Charles Burlingham, Mrs. Richard Meredith, Mrs. Donald B. Straus—for the selection of the front cover illustration: photo by F.lli Alinari Venezia—Biblioteca Marciana—Breviario Grimani; p. 107, from Cornuti, **Canadensium Plantarum**, etc.; pp. 109, 110, 111, 112, Strawberry Hill, Rhinebeck, N. Y., except upper left, p. 111, E. N. Mitchell; p. 113, E. N. Mitchell; pp. 114, 115, T. H. Everett; p. 116, upper left, Adrien Boutrelle, courtesy Flower Grower Magazine, upper right, Paul E. Genereuv, courtesy Horticulture; pp. 117, 118, Silvia Saunders; pp. 119, 120, Paul E. Sandahl, p. 122, Rose B. White; pp. 124, 125, 126, W. H. Hodge; p. 127, upper, W. H. Hodge, lower, Andrew Bunn; p. 128, W. H. Hodge; pp. 129, 130, 131, J. J. Wurdack; pp. 135, 136, E. N. Mitchell; p. 137, upper, courtesy Edward C. Delafield, lower, courtesy, Mrs. David Rockefeller; p. 138, upper, courtesy Detmer Nurseries, Tarrytown, N. Y., lower, courtesy, Sleepy Hollow Restorations; p. 139, T. H. Everett.

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# FRENCH BOTANISTS AND THE FLORA OF THE NORTHEASTERN UNITED STATES - J. G. MILBERT and ELIAS DURAND

By William J. Robbins

Presented at the Centennial Observation of the death of Francois-Andre Michaux at the Colloque International No. 63, Paris, September 11-14, 1956. The whole report of this colloquium is found in the book, "Les Botanistes Francais en Amerique du Nord," printed by Centre National de la Recherche Scientifique, 360 pp. 34 pl. Paris. 1957.—The Editor.

SIX DAYS AFTER LANDING on San Salvador, Christopher Columbus wrote, "All the trees are as unlike ours as day is to night, and so are the fruits and also the plants." In spite of these observations, he does not appear to have carried back to Europe much cargo from his first voyage, but from the second he sent home a considerable collection of the vegetables of the New World. Christopher Columbus might, therefore, be regarded as the first collector of plants of America.

Like those of Columbus, the explorations which followed were made for the most part in tropical areas and, as a consequence, plants from tropical America became known to Europeans earlier than those from the temperate regions.

In the early botanical explorations of North America, especially in Canada and the northeastern United States, Frenchmen played an important role. André Thévet published in 1557-1558 *"Les singularitez de la France antarctique, autrement nommé Amérique—."* Although mostly concerned with Brazil and other parts of South America, he wrote of Florida and Canada and described maize, tobacco, pumpkins, gourds, and a few plants not in cultivation. Jean Nicolet, a trader, is reputed to be the first European who saw the prairies of Illinois.

It is not possible within the limits of a brief paper to discuss adequately the contributions made by Frenchmen to our knowledge of the flora of northeastern North America, nor even to list the names of all those who, in one way or another, played a role in the exchange of plants between Europe and North America or explored the botanical riches of that great continent. I can only call your attention to a few to whom we are all so deeply indebted.

One of these is Father Sagard, who published in 1635 his great *"Histoire du Canada et Voyages que les Fréres Mineurs Recollects y ont Faicts pour la Conversion des Infidelles,"* in which part of Chapter 5 of the third book is devoted to the fruits, plants, and trees of the country. Some say this work is characterized by extreme inaccuracy and credulity. However, although it is difficult, if not impossible, to identify all the plants he mentions, his comments on them and their uses by the Indians are written in a most interesting fashion and on what seems to be personal experience.

He begins by saying that it is impossible that those who undertake to describe the things in a large country should not deceive themselves sometimes as was done by those who have said there are no cedars and no grapes in America. He reports, with what I interpret to be extreme regret, that the grapes of the Huron country would make a good, strong wine, if the savages had the ingenuity to cultivate and convert them; but lacking sufficient knowledge, they are content to eat them without making wine of them. It is strange to me that the North American Indians did not make a fermented drink, since the production of alcoholic beverages was so general amongst primitive peoples in other parts of the world.

Sagard tells of eating a small white "onion" with leaves like the lily-of-the-valley (I judge this to be wild leek, *Allium tricoccum)* with a little salt and pepper but "without bread, without oil and without vinegar." He mentions roses, lilies, and various fruits and roots, but the most beautiful plant in his opinion was one which the Hurons called shell-of-the-turtle, the leaf of which he says—except for color—resembles the shell of the homard; closed at the bottom and hollow like a cup, it furnished, in case of need, a drink of dew which collected in it each summer morning. I assume this plant which he admired so much to have been the pitcher plant, *Sarracenia.*

He describes how the Indians obtained oil from seeds of the sunflower and asks, "How is it that a savage people is able to develop the ingenuity to render an oil of which we are ignorant, unless it is by the aid of Divine Providence which gives to each of us the means for our preservation and without which, having no instruction, people would remain miserable like brutes themselves." I commend Sagard to you as a true Gaul and a keen observer of plants, though no botanist.

The first work relating specifically to plants north of Mexico was published in 1635 by Jacques Philippi Cornuti, a Parisian physician, less than thirty-five years after the first permanent settlement in Canada. The book is illustrated by excellent drawings and most of the species illustrated are readily recognizable. *Asarum canadense* is a good example; it was given almost the same name, *Asaron canadense,* by which it is known today. Though not all the plants included came from the New World, a number of plants from northeastern America were described and figured for the first time.

Cornuti was probably never in Canada, and it is not known who supplied him with the plants he described and figured. It was not Michael Sarrasin, the first Canadian resident botanist for whom the pitcher plant, *Sarracenia,* is named, because Sarrasin was born twenty-five years after Cornuti's book was published. I have learned from Professor Jacques Rousseau, Director of the Montreal Botanical Garden, that the North American plants figured in Cornuti's book were drawn from plants grown in the Paris garden of the School of Medicine and may have been sent by Lewis Herbert, the first colonist in Canada and a former apothecary. Since Cornuti has a word of praise in his introduction for an illus-

trious navigator, Professor Rousseau assumes that Samuel de Champlain, who was interested in botany, may have had a part in supplying the plants. Professor Rousseau's further researches will be awaited with much interest.

Pierre François Xavier de Charlevois first came to Quebec in 1705 and published in 1744 *"Histoire de la Nouvelle France"* which contains observations on plants. François Jean Chastellux in *"Voyage dans l'Amérique septentrionale dans les années 1780-1782"* and Claude C. Robin in *"Nouveau voyage dans l'Amérique septentrionale en 1781. . . ."* included observations on plants. Constantin François Chasseboeuf Boisgirais, a friend and correspondent of Benjamin Franklin, came to the United States in 1795, visited Pennsylvania, Virginia, Kentucky, and Louisiana, and wrote *"Tableau de climat et du sol des Etats Unis d'Amérique"* in 1799.

Reference might also be made to François Barbé-Marbois who came to Philadelphia in 1779 as First Secretary of the Legation, when the Chevalier de la Luzerne was the new French Minister. Barbé-Marbois was a student of botany and much interested in the strange plants, nut trees and flowering trees of America. In an incredibly short time he nursed the vanished legation gardens back and planted magnolias, sassafras, tulip-trees, vines and flowers. He dug and planted with his own hands and took pleasure "in seeing the progress of his family" (of plants). For him the legation garden took the place of concerts, operas, comedies, hunting, promenades, and picture galleries.

However, the most famous and the best known botanically of French visitors to the United States were André Michaux and his son, François. The contributions of André Michaux and his son to the broadening and deepening of cordial relations between France and the United States of America are well known. André arrived in the United States in 1785 with introductions to George Washington and at once proceeded to establish a garden in the vicinity of New York.

He came to the United States through the efforts of J. Michel Guillaume St. John de Crèvecoeur who had arrived in the English Colonies by way of Canada in 1760; settled in Orange County, New York, and after the American Revolution was for a time French consul in New York. Crèvecoeur was deeply interested in agriculture on which he wrote extensively and charmingly. He introduced a number of plants into America, corresponded with noted farmers of his time, including George Washington and Thomas Jefferson, and assisted in laying out a botanical garden at New Haven, Connecticut. Crèvecoeur's influence on the botanical relationships between France and the United States was great and, I believe, has never been fully evaluated.

Because Michaux was not a citizen, it was necessary for him to be granted permission to hold land and the Legislature of the State of New Jersey passed an act on March 3, 1786, enabling André Michaux, "botanist to his Most Christian Majesty," to purchase land to be used for the sole purposes of a botanical garden. In the preamble of the Act, it was stated that Michaux "has full power to draw from France, at the King's expense, any tree, plant or vegetable that may be wanting in this country" (U.S.A.). Michaux planned to establish a garden of about thirty acres "in order to make useful experiments with respect to agriculture and gardening, and to make a depository not only of French and American plants, but of all other productions of the world which may be drawn from the King's garden at Paris."

He purchased thirty acres across the Hudson River, about opposite 60th Street in New York City, for seven hundred and fifty dollars, and on May 12, 1786, sent M. Cuvilliers a letter which gave an accounting of expenses and was accompanied by a plan showing the location of the garden bordering on Cromakill Creek, a branch of the Hackensack River, and traversed by the Hackensack Turnpike. It was located four miles by water from New York City to the Weehook (Weehawken) Ferry and thence two miles by land. Plans of the garden itself and the house built on the grounds were also furnished.

Michaux was accompanied to the United States by Pierre Paul Saunier, journeyman gardener, aged seventeen, who was entrusted with the care of the garden. The garden, popularly known as "The Frenchman's Garden" (probably because of Saunier rather than Michaux, who remained at New York for one year only), is said to have been a fashionable recreation spot for early residents of New York. Paul Saunier remained in the United States until his death in 1818. During these thirty-three years, he purchased several parcels of land in the vicinity of the original Michaux Garden, and his children married in the community.1/

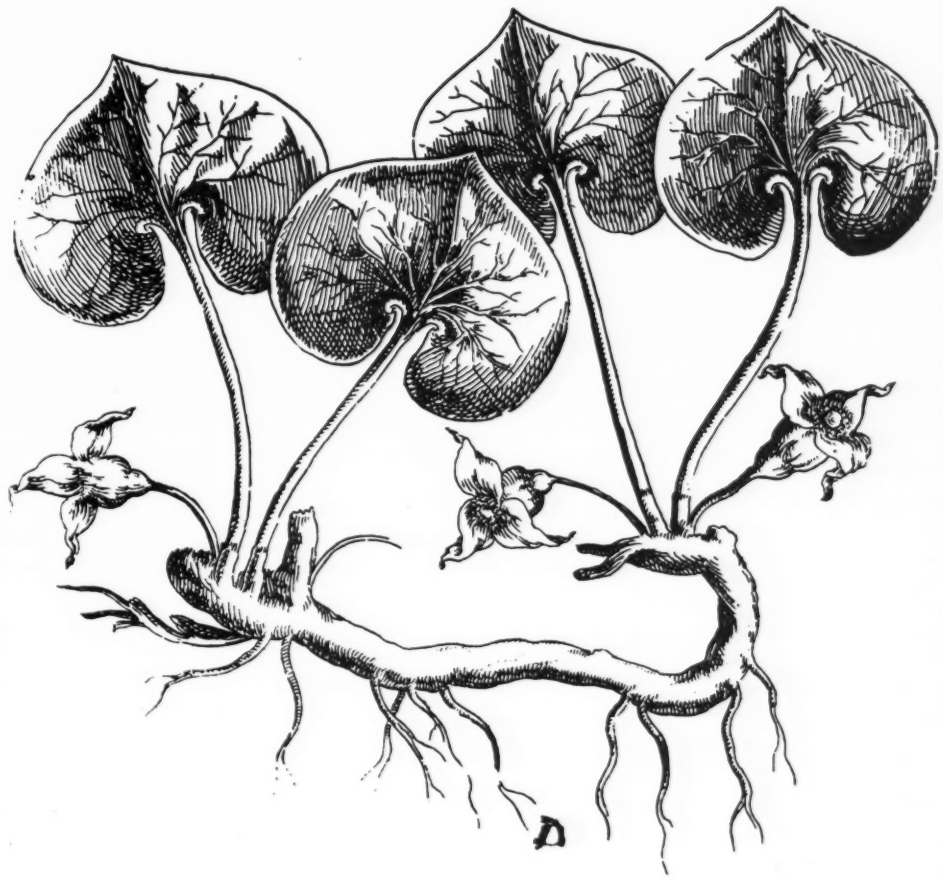
Paul became a garden oracle, giving instruction on propagation, budding, grafting, and the care of fruit trees and ornamental plants as well as in the principles of classification of Jussieu in which he had been well grounded through his early training at the Jardin des Plantes. He is credited with the introduction into the United States of the Lombardy poplar/2 and with bringing into cultivation *Castanea pumila,* the chinquapin, as well as other meritorious plants. His hospitality was enjoyed by Pursh, Douglas, Bradbury, and other foreign naturalists who came to the United States. Eleuthère Irénée du Pont in 1802 and 1803 obtained quantities of seeds and plants from Saunier (Saulnier) which he sent to various correspondents in France.

Dr. H. H. Rusby, for many years on the staff of The New York Botanical Garden, married a great-granddaughter of Paul Saunier and described a visit made in 1884 with two granddaughters of Paul, to the site of the Michaux Garden.

The garden and commissions were eventually transferred to Saunier, and afterwards to his oldest son, Michel, who continued to make shipments of plants and seeds nearly to the time of his death. One of the granddaughters described to Rusby the appearance of the wagons with their great stacks of boxes, looking from a distance like loads of hay. The orders steadily decreased until they ceased in the 1830's with one final shipment of three small boxes.

1/ I have been in correspondence with Miss Ruth Saunier and Pierre Paul Saunier, great-great-grandchildren of Paul Saunier, who live in the United States. Durand says Saunier was seventeen. Other evidence indicates he was thirty-four when he came to the United States.

2/ Saunier may have introduced the Lombardy poplar to the New York area. He was not the first to bring it to the United States. Ethel Armes in "Nancy Shippen. Her Journal Book" (J. B. Lippincott; 1935) says that the first weeping willows and the first Lombardy poplars in the colonies grew at Woodlands, the county seat of Alexander Hamilton on the west bank of the Schuylkill River near Philadelphia. The date was probably about 1745.



*Asaron (Asarum) canadense* from Cornuti, *Canadensium Plantarum*, etc.

François Michaux never spoke of Paul but with respect and affection, as may be judged from the following quotation:

"Paul was so exclusive in his attentions to his avocations that hardly any other subject than trees and plants ever found entrance into his mind. To the day of his death, he considered his little circumscribed residence as still the property of his royal master; and ignorant of the vicissitudes of political revolution, reluctantly gave credence to the fact of the decapitation of his bountiful but unfortunate King. Paul now lies in the Hackensack churchyard; his tombstone records not half his excellence."

Sometimes in our absorption with the great we may forget those more humble like Paul Saunier, journeyman gardener, whose influence was far greater than his position in life might suggest.

Another Frenchman to whom the State of New Jersey granted the right to hold real estate was the Count de Survilliers (Joseph Bonaparte). He purchased in 1816 an estate of one thousand acres (later increased to some eighteen hundred acres), near Bordentown, New Jersey, about sixty miles from New York City. He remodeled the house already on the estate, added a number of smaller buildings, and established a large garden, including many rare plants, in which his daughter, Princess Zénaide, tended her flowers. If we accept the account in the novel THE TONTINE by Thomas B. Costain, as approaching truth, Joseph was especially interested in trees. We know that he accompanied the Philadelphia botanist and pharmacist, Elias Durand, on botanical excursions. Little remains of Joseph Bonaparte's garden.[3/]

Before I close these fragmentary remarks, I should like to speak of two additional Frenchmen, Jacques Gérard Milbert and Elias Durand.

Jacques Gérard Milbert was born in 1766 in Paris, where he died in 1840. He was professor of design at the Ecole des Mines and in 1800 accompanied the expedition to southern lands commanded by Captain Baudin. Illness constrained him to stop at the Ile-de-France for two years. As a result of his observations there, he published in 1812 *"Voyage pittoresque à L'Ile-de-France, au Cap de Bonne-Espérance, et á L'Ile de Ténériffe"* in two volumes and an atlas of which the illustrations were in part engraved by the author.

We are interested in Milbert because he came to America in 1815 charged by Hyde de Neuville, the French Minister to the United States, to investigate natural history. He remained in the United States for seven years, during which time he traveled extensively, met many of the prominent men of the day, collected objects of natural history which he sent back to France, made sketches of parts of the country he visited and observations on geology, geography, local history, customs, and conditions. He suffered illness and had difficulty in obtaining sufficient funds to support his explorations.

The record of his stay in America is found in two volumes and an atlas, entitled *"Itinéraire pittoresque du fleuve Hudson et des parties láterales de l'Amérique du Nord, d'après les dessins originaux pris sur les lieux,"* published 1827-29. (Miss Constance D. Sherman of the American Museum of Natural History has translated this work into English, and it should soon be available in published form.)

Milbert collected and sent to Paris twenty-five cases or barrels of seeds of three hundred species of plants, herbarium specimens, and six hundred living trees, as well as mammals, birds, reptiles, fishes, insects, geological specimens, and other items of natural history. His shipments included a live eagle, a live bison, a live elk, live turtles, and a live "crocodile"—the latter, dead on arrival. In a report by Louis Cordier, De Jussieu, and Brongniart,

3/ Louise Hall Tharp visited Bordentown in the summer of 1954. She reports that a large mansion now occupies the site of Joseph Bonaparte's home, Point Breeze, on the highest bluff overlooking Cross Creek where it joins the Delaware. This house replaced the second house built by Joseph Bonaparte which was destroyed. Remains of a pier on Cross Creek and the brick archway and part of the brick-lined tunnel which led from the river to Point Breeze are still visible. She says that formal gardens are still cultivated, but the lake and pleasure park is a wilderness. The estate remained in the possession of the Bonaparte family until at least 1846, when Adolph Mailliard and his father, who was the natural son of Joseph Bonaparte, came to the United States to act as executors for the estate of Bonaparte who died in 1844. The palace at Bordentown was left to Bonaparte's grandson, Prince Joseph, but it was also, under the will, Louis Mailliard's home for life. I do not know when it passed from the possession of the Bonaparte family, but it is now owned by the Divine Word Missionaries and is used as a seminary.

to his Excellency, the Minister of State in the Department of Interior, mention is made of new "species" of oak, elm, maple, poplar, sumac, walnut, chestnut, thorn, pine, cedar, juniper, spruce, fir, larch, and cypress sent by Milbert.

His interest in collecting trees for France was in part, at least, because of his conviction of the need for the conservation of forests and reforestation. In the introduction to his book, Milbert makes a moving plea for the preservation of forests, the destruction of which he noted around New York and other large cities he visited in the United States. He was concerned with forest conservation because he had seen sections of France, once covered with forests and filled with game, where deforestation had resulted in the erosion of pastures, leaving bare rock; had eliminated trees which had acted as windbreaks and protected fruit trees and other crops in the neighboring plains from the fury of the winds, had changed beautiful rivers into those which were raging torrents at some periods of the year and dry rock-filled beds at others, and limited the water which once had irrigated fertile lowlands. This attitude on forest conservation is so modern that it is hard to realize that it was expressed nearly one hundred and fifty years ago.

Milbert gave special attention to plants other than trees which might be useful in France. For example, he sent back the dog bane *(Apocynum)* because the pappus of the seeds resembled cotton. This reminds me that the similar pappus of the seeds of milk weed *(Asclepias)* was gathered in the last war and used for filling life belts. He sent a desirable variety of potato, which he located in Philadelphia, and *Urtica* from which, he reported, cheap rope and a superior oakum were prepared. He sent a plant which he called "red top," used, according to Milbert, in the state of Connecticut to make hats rivaling those of Livornice (Leghorn) and selling for five hundred francs. I suspect the fantastic price he gives, which at the time was the equivalent of one hundred dollars, must be an error. The only plant I know which is native to the United States and called "red top" is a grass, *Triodia flava. Agrostis stolonifera*, introduced from Europe, also has the common name "red top." In any event, I have been unable to find any information on the making of hats in Connecticut from an indigenous plant in the early part of the nineteenth century, though hat-making is today one of the important industries of that state.

What manner of man was Milbert? He spent nearly eight years away from his family and his beloved France and still requested, on his return, support for another expedition to the United States. His relations with his family must have been good. A son transmitted to the French authorities Milbert's request for a gun (which he received a year later) and asked more than once for additional funds for his father's work. Milbert himself records his pleasure at the prospect of returning to France and to his family and friends. What made him endure the sacrifices necessary to accomplish his mission? Through the courtesy of Mlle. M. G. Madier of the Museum of Natural History, I have learned that there are in the Archives Nationales twelve letters written in 1820 by Milbert from New York to the Museum of Paris, seventy-four pages of letters between 1819 and 1823 addressed to him or written on his subject, and a catalog of about forty-five pages listing the shipment of various items during his sojourn in the United States. These I have not yet had the opportunity to examine in detail.

His books, reports, and correspondence, as far as I have seen them, reveal a man of great patriotism, restless energy, an insatiable and all-embracing curiosity with considerable artistic ability and, as Georges Cuvier said *"une perseverance inouie."* I would surmise that he was ambitious, anxious to impress the distinguished professors and others in France to whom he sent his specimens and made his reports, and I would assume also that he had an engaging and attractive personality. In other words, Milbert must have been a man of parts, one of those individuals whose combination of characteristics makes them indispensable units in man's quest for knowledge.

Elias Durand (Elie Magloire Durand) was born at Mayence, France, in 1794 and died in Philadelphia, Pa., U.S.A., in 1873. He was the youngest of fourteen children, though he himself had but two, a daughter and a son—only one, the son, surviving.

His father was a recorder of deeds. At the age of fourteen, Elias began a period of four years of study under M. Chevalier, a pharmacist of Mayence. In the fall of 1812 he arrived in Paris where he attended lectures by Thinard, Gay-Lussac, Lefevre, and Gillault. He received a commission as assistant pharmacist, presented his commission to Field Marshal Kellerman, and joined the army at Magdeburg. He participated in most of the battles which followed, including the bloody one of Leipzig, during which it is said he gathered a specimen of *Menyanthes trifoliata,* thus evidencing under extraordinary circumstances the interest in botany which later dominated his life. At the battle of Hannau, he was one of about a dozen who survived unharmed out of some hundreds killed and wounded in an attempt to cross a stream. He was captured by the enemy; however, the officer-in-charge, taking pity on the few left from so much destruction, freed Durand after a short detention.

On the downfall of Napoleon, Durand resigned his commission and was employed in a drug store in Nantes where he directed chemical manipulations in the apothecaries' garden and lectured to students on medical botany. On the return of Napoleon, he at once rejoined the army and served during the celebrated "one hundred days" as one of the National Guards. After Napoleon's final defeat, Durand, as a Bonapartist, found conditions uncomfortable in France and emigrated, in June 1816, to the United States where, except for brief visits to France, he spent the balance of his life.

Durand landed in the United States at New York; he proceeded to Boston from where, after a few months of employment as superintendent in a chemical laboratory, he removed to Philadelphia. There he found a similar position which after a short period he abandoned in order to devote himself exclusively to pharmacy. He became chief clerk in the establishment of Mr. Ducatel of Baltimore, whose daughter he eventually married. When Ducatel retired in 1823, leaving the business to his son, Durand became a partner; but at the end of the year he decided to open his own store in Philadelphia. He did so in 1825, after a short trip to France.

Although his store ultimately became

(Continued on page 123)

*For Beauty:*

# LILIES

*By* A. D. Rothman

*Lilium Parkmanni* 'Jillian Wallace,' one of the finest of the newer *auratum* X *speciosum* hybrids

IF YOU WOULD GROW the larger number of lily species and varieties with optimum results, then give the first attention to the character of the soil, the drainage, and the adequacy of sunlight. Since, by and large, these are the same considerations that hold in growing most of the desirable ornamentals, you may regard the above injunction a banality or draw the conclusion which I hope you will draw—namely, that lilies, on the whole, are not much more difficult to grow than other desirable garden plants. You may free yourself of the thought that is in the back of the mind of so many gardeners —that lilies are *difficult*.

Lilies can be grown casually. By that I mean that there are numerous beautiful varieties, low in price, and tolerant of a wide range of conditions, which can be interplanted among other flowers in a perennial border of ordinary character and will give fine accents of color and form all during the summer. The same reasonable care you give your border as a whole will suffice for these lilies. But suppose you want to give a full measure of devotion to this historic and superb flower. You are a true devotee and you want a lily garden. Then you face only a moderate and pleasant challenge.

Select a spot, as small or as large as you like, in full sunlight. If it is on a slope, so much the better, for lilies like sharp drainage. If small shrubs or conifers break the sunlight a little, *but only a little*, over that site during the day, accept the compromise. If the soil on the chosen spot is good and not a jungle where the greedy roots of nearby permanent plantings roam and deny everything else nourishment and moisture, that is all to the good. Under any circumstances, don't give lilies the kind of competition they are certain to get from overbearing neighbours. But don't worry much as to the quality of the soil as such. You can easily make the kind of soil lilies like and add it *on top* of the existing grade. Raised beds improve drainage, and no matter how good the existing drainage is, the lilies will benefit by being lifted a little in the air, so to speak.

You will be surprised to learn what kind of soil mixture lilies as a genus like best: the coarse sand derived from sifting ordinary bankside gravel (used in road making) through half-inch hardware cloth. To shovel for shovel of this sand, add completely dead compost and leafmold — but no lime, please. Lilies like an acid soil. The resultant mixture will be of frothy consistency. You have the right consistency for lily bulbs, when you can dig them with your hands from the soil. Spread the mixture up to a foot high over the site; and by banking the edges of the bed with a mat of pine needles to keep it from washing, you need not worry about even a very high bed staying in place.

Having prepared the soil early in October, by the last of that month and all through November until the ground freezes quite hard, you are ready to do your planting.

Before listing some of the varieties that are likely to give you the most pleasure, depending on the degree of your experience with lilies rather than the depth of your devotion to the genus, it is essential to talk about the quality of the bulbs you get. It is the conviction of this writer that nine-tenths of the failures that occur with lilies arise from poor bulbs.

Many plants are called lilies which are only distant relatives of the genus *Lilium* through their common heritage in the great plant order *Liliales* down through the family *Liliaceae* and the tribe *Lilieae*. This is all by way of saying that many of the true lily's relatives can take a lot of abuse before getting to the gardener's hands and still survive. The onion and tulip, for instance, are dried out after maturing and kept above ground with no protection. The lily bulb, if given such treatment, would be virtually dead in a day.

The lily bulb (Woodcock and Stearn, in their authoritative LILIES OF THE WORLD, define a lily as having "a scaly bulb with rather loosely overlapping scales not enclosed . . . by a membranous outer coat or tunic.") is never truly dormant, bruises very easily, is uncomfortable out of the ground, dehydrates quickly, and requires expert care in storage and packing before it gets to the gardener. All these factors are the supplier's problem. If he meets it, he is a reliable source. And it is only from a reliable source that the gardener should buy his lily bulbs. Unless he starts with good lily bulbs, he is in for trouble. A good lily bulb is one which is firm and plump, free from disease, and with an appreciable part of its root system intact (although this is not an inflexible part of the definition, since the bulbs of some varieties don't hold on to their roots very long after being dug or on being dug).

Here are the lilies the writer suggests either for the gardener who wants to introduce them casually into his perennial border or for the gardener who

*Lilium pitkinense*, one of the newly discovered American western species, a red and yellow that turns all red on maturity. (From a painting by the noted California taxonomic botanist, Lawrence Beane.)

has made the more elaborate arrangement for a bed of their own:

*L. amabile*, a reddish turkscap; of great vigor, height up to three feet, July.

*L. amabile luteum*, the yellow form, July.

*L. callosum*, a slender-stemmed, tiny, Dutch brick-red flower with tightly reflexed petals, two feet, June-July.

*L. candidum*, the famous Madonna lily; a semi-trumpet, pure white with golden pollen, five feet, June.

*L. concolor*, a brilliant red, star-shaped, upward-facing little lily, two and a half feet, June-July.

*L. dauricum*, an apricot-colored, upward-facing lily, two feet; one of the earliest bloomers, May.

*L. Davidii* var. *Willmottiae*, an orangey red turkscap; of great stamina, three feet, June-July.

*L. formosanum*, a fragrant, white tubular trumpet; of varying height and varying blooming time, as late as October.

*L. Hansonii*, a yellow, spotted, reflexed lily of heavy texture, four feet, June.

*L. Henryi*, an orange yellow turkscap with glossy foliage; of great strength, seven feet, July.

*L. longiflorum*, the Easter lily, two to four feet; in the garden this blooms in July-August.

*L. speciosum rubrum*, a red and white, very showy turkscap from Japan; of varying height, July-September.

*L. tsingtauense*, an angular-shaped, orangey red, upward-and outward-facing flower with glossy foliage, three feet, July.

All the foregoing are species or varieties of species to which the familiar phrase "of easy culture" can be applied. They are all beautiful and worthy of any garden.

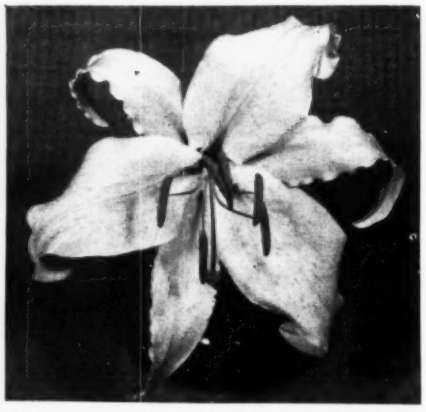
Of hybrids among lilies, it is to be feared that one will soon be able to say with deep regret that they are as numerous as the sands in the sea. Every man his own geneticist is an awesome thought, but the fascination, not only of creating something new, but of ushering it into the world seems not easy to overcome, as has been evidenced in recent years in the flower world. While only too many of the introduced lily hybrids of the last twenty years are, to put it mildly, of doubtful value, there are some, certainly, which are outstanding and should go into your garden. Then there are a few of the older hybrids which are glorious, and some that I would call "accidental" hybrids, since the species from which they were derived are now either difficult or impossible to obtain and the manner in which the hybridization occurred was fortuitous, which must be included as highly desirable. In the last category I should bracket the following:

Older hybrids: *L. umbellatum*, upward-facing, cup-shaped flowers of various colors, three feet, June-July; *L. testaceum*, reflexed, pendant flowers of biscuit color, four feet, June-July.

"Accidental" hybrids: *L. regale* hybrids, *L. Sargentiae* hybrids, *L. centifolium* hybrids, *L. sulphureum* hybrids —these are all magnificent white trumpets, up to seven feet in height and blooming from July through August.

Among the moderately newer hybrids which have more than established their worth are the *Hansonii* X *Martagon* crosses. The best known is probably 'Mrs. R. O. Backhouse,' an enchanting yellow, purple-spotted, tightly-reflexed June bloomer that grows up to five feet. But of these crosses there are many named varieties and many colors, to maroon and bluish purple, and all that I know are very good.

The so-called *aurelianense* hybrids, the most noteworthy of which are yellow trumpets, none of which, unfortunately, are completely resistant to fading in the sun, hold out considerable promise. But in this group, as of today, you pay your money and you take your choice! Perhaps you will leave them to another day.



'Electra,' the first of the named Pfeiffer Hybrids, *Lilium auratum* crosses with *L. japonicum* and *L. rubellum*

A white maculated Pfeiffer Hybrid, the fine *L. auratum* X *japonicum* and *auratum* X *rubellum* crosses

There are also the newer "bread and butter" hybrids which you should not overlook. They are vigorous and unpretentious. The best of them, in my opinion, is a brilliant red upward-and outward-facing, reflexed lily of outstanding constitution, introduced only a few years ago by the Section of Ornamentals, under the direction of Dr. S. L. Emsweller, of the United States Department of Agriculture. This is *L.* 'Mountaineer.' Another from the same source is *L.* 'Mega,' yellow in color with rufous reverse of petals. Dr. Emsweller's Section has also introduced two spectacular hybrids which are still, unfortunately, very scarce: *L.* Potomac Hybrids, a *speciosum-rubrum*-like plant, but with larger and more striking flowers, and *L. myriophyllum* X Havemeyer Hybrids, symmetrical, creamy, August-blooming trumpets with deep yellow

*Lilium Sargentiae* hybrids in the "Ladies' Border" at The New York Botanical Garden

throats. If you can get these, grow them; they are not demanding as to conditions.

Here are half a dozen other "bread and butter" hybrid lilies which are a personal preference of mine and which may please you: *L.* 'Amaryllis,' a large flaring golden-red flower, three feet, July; 'Margaret Johnson,' a bold, heavily-spotted, salmon-colored, reflexed, upward-and outward-facing flower, four feet, July; 'Lemon Lady,' a strong-growing, yellow turkscap, two and a half feet, July; and *L.* 'Lillian Cummings,' a cherry-red, upward-and outward-facing, reflexed flower, four feet, June-July.

The well-inured lily fancier will have been the first to note the absence of some of the most enticing lilies from my list of suggestions for your perennial bed or lily garden. It was intentional, since this article is aimed at the beginner or one whose experience with lilies has been tentative. It was also motivated by the desire not to get entangled with the word "difficult." This adjective is properly applied to some of the great aristocrats of the lily world, only if it is defined as meaning that the range of conditions under which they will do best is rather more restricted. For instance, take *L. auratum,* the bowl-shaped, golden-ribbed, white lily of Japan, or most of the hybrids derived from it, including the exquisite *L. Parkmanni* 'Jillian Wallace,' and Pfeiffer Hybrids. Frankly, I think it requires something of search and experimentation to get this lily to fall in love with the spot where you put it—although it often does well on first trial. Or take *L. japonicum,* the lovely pink, flared trumpet, also of Japan. I think it does best if planted above a source of running water, to which its roots have access. This condition isn't always easy to provide. And there are other of the fine species which you may fail with initially, because of a little something lacking in what you provide them in the way of location, soil constituents, or the like. Some of these species have their original homes in volcanic soil, or soil built up on detritus of decayed forests, or have developed under climatic conditions of intensely brilliant sun and alternating periods of extreme wet and extreme dry. It is not easy to duplicate all these in your perennial bed or lily garden. But for all that, it is worth trying these species. In many instances, despite all fears, they prove themselves good soldiers and adapt themselves to a new locale. Among these species, I like the following:

*L. Brownii,* an outstanding white trumpet with chocolate-brown reverse of petals, four feet, June.

*L. lankongense,* pendulous reflexed flowers of rose color, two to four feet, July-August.

*L. nepalense,* a greenish white, semi-trumpet with purplish brown throat, three feet, July.

*L. pyrenaicum,* a greenish yellow turkscap with persimmon-colored pollen, three feet, July.

*L. rubellum,* a pink, funnel-shaped little flower, two feet, June-July.

*L. Szovitsianum,* a bland yellow, bell-shaped flower, three feet, July.

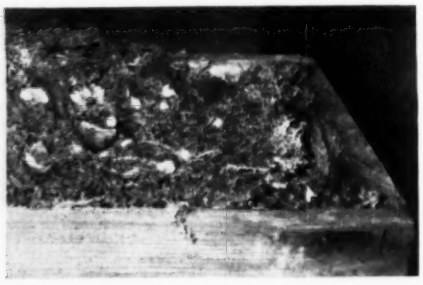
Every lily mentioned in the foregoing is an exotic introduced from Europe and Asia. Strange—when the North American continent is itself the habitat of as important and beautiful a group of lilies as exists anywhere in the world. Moral—we should count our blessings and act on them. We should grow more of the American wildlings in our gardens. There may be up to forty distinct species among our native lilies; there's good reason to believe that they have not yet all been identified, although the distinguished taxonomic botanist, Larry Beane of Fresno, California, is doing a capital job on this task with the monograph he has under preparation. As to the sub-species and varieties, no one would venture a guess as to their number; it is certainly very large.

We should start with our eastern varieties since, on the whole, they are easiest, although such Atlantic section denizens as *L. Catesbaei,* a red and

*Lilium auratum* does well when given proper care; here it is growing in a Long Island garden

yellow spidery lily, and *L. philadelphicum,* our common red wood lily, hardly take readily to the garden community. *L. canadense,* our yellow meadow lily, and its reddish form, *rubrum, L. superbum,* and *L. michiganense,* tall growing, red and yellow turkscaps, and *L. Grayi,* a demure, bell-shaped, blood-red lily, are quite adaptable. And to grow them is to assure oneself of a summer filled with beauty.

The western species are, for the most part, "touch-me-nots" when transported from the West to the East, save to the fancier who is prepared to elicit their cooperation by simulating the conditions under which they grow in their native homes. There is one exception, *L. harrisianum* (formerly *L. pardalinum giganteum*), which, like its eastern congener, *L. superbum,* is virtually a sure thing in almost any garden. But to those who want their attention, and ultimately their complete devotion, engaged, I suggest trying *L. Kelloggii,* a lavenderish white little turkscap, and *L. Washingtonianum purpurescens,* a white semi-trumpet which turns lilac as it matures. They will repay cozening . . .



These lily bulbs have been propagated vegetatively from scales

But here I have left the gardener poised with trowel in hand ready to plant any or all of the varieties I have mentioned, literally surrounded by lily bulbs of every size, color, and shape, and have not yet told him what to do with them. Well, the actual culture of lilies is not very complex. Since some lilies have stem roots as well as basal roots, these can be planted a little deeper. A good working rule is to cover a bulb with soil to a depth of twice its height from base to tip. Thus, a bulb which is two inches high would have four inches of soil over its tip. But no matter what the size of the bulb, I feel that it should not have more than six inches of soil over it. *L. candidum,* which makes a winter basal rosette of leaves, and *L. testaceum,* its off-spring, should not be covered with more than two inches of soil if the bulbs are large, and less if they are small. Planting distances are a foot to eighteen inches apart for large bulbs and nine to twelve inches for small bulbs. I favor autumn planting, although planting can be safely done in the spring.

An all-year round mulch is essential for lilies. In the summer it keeps down weeds, keeps soil temperatures more even, and conserves moisture. The best mulches are pine needles, buckwheat hulls, or wood chips, applied to a depth up to six inches. In the spring such a mulch delays top growth, reducing the danger from late frosts. The mulch ultimately breaks down to add humus to the soil, but on application it is necessary to add three-quarters of a pound of ammonium sulphate to each bushel of mulch to compensate for the nitrogen loss from the soil during the decomposition process. Spring top-dressing with a little ammonium sulphate or a 5-10-5 fertilizer is a good practice—and if you are a foliar feeding enthusiast, foliar feed to your heart's content.

Take only a third to a half of the stem when you cut lilies, to leave enough foliage for the plant to mature on. Unless you wish to save seed—and growing lilies from seed can be fascinating—cut off dead flowers. And don't put too great a drain on the bulb, if it is seed which you are after, by leaving more than three capsules on a stem. When the stems die down in the autumn, cut them down to within three inches of the ground and burn them. You will know when the bulbs begin to crowd, after being *in situ* for about three years. Lift them, separate them, and replant them in another location in new soil.

Good lily bulbs are firm and plump, disease free, and have good root systems

Like virtually all desirable ornamentals, lilies have their enemies—animals, insects, virus, and fungous diseases. Protect your lilies from rabbits and woodchucks. An excellent combination spray against insects, and at least one fungous disease, is Bordeaux mixture, with a touch of nicotine sulphate in it and more than a touch of arsenate of lead. The lead takes care of the chewers among the insects; the Bordeaux is

(Continued on page 123)

Lilies like sharp drainage. This winter scene shows beds raised a foot or so above slope

*A Plant Doctor Grows*

# ROSES

**By Cynthia Westcott**

**Based on the talk given by Dr. Westcott at the Fifteenth Annual Rose Day at The New York Botanical Garden, June 13, 1957.**
**—The Editor.**

THIS PAST SUNDAY (June 9) about eight hundred people tramped through my small backyard to see how I grow roses without any *time*. I mean that almost literally. My six hundred guinea pig roses seldom get more than an hour a week, including the pesticide tests.

In previous years I have had a full-time assistant. In 1957, my only help has been a high-school boy after 3 p.m., and on Saturdays, but we have cared for forty rose gardens besides my own. Rose growing is necessarily streamlined to the essentials, and perhaps this is the secret of success. Too many gardeners fuss with their plants too much. Roses need only a good start in life and a little regular care.

*Location.* Ideally this should be in well-drained soil, in a place away from tree roots, with six hours of sunlight, and good air-circulation. In my own garden there is little air circulation, a third of the roses are far too close to tree roots, and some get almost no sun. Yet most of the roses that I planted when I moved to Glen Ridge twenty-four years ago are still blooming.

*Planting.* I firmly believe in well-prepared beds with plenty of organic matter incorporated, and in planting with care at the right time. In New Jersey, dormant roses do equally well planted in November or in *early* spring. They seldom thrive if planted much after the middle of April. After that, I have better luck with the excellent potted roses now available. I have occasionally lost roses by planting too deep, so I like to keep the union of stock and scion almost at ground level. It is important to hill up after planting —for two weeks or so in spring, for all winter after November planting.

*Mulching* eliminates ninety percent of the work in growing roses. I use "Multex," buckwheat hulls, and they are left on permanently. The soil under the mulch is never disturbed, no time is wasted in cultivating. As the mulch wears away I add more, as I can afford it.

*Winter protection* is a time-consuming task I have entirely eliminated except for new roses the first winter. I have been comparing hilled and unhilled gardens for many years in New Jersey and find there is little difference in winter loss, if the roses were healthy when they started dormancy. When soil or compost is brought in for hilling, there is far more effort required in weeding the next season.

*Pruning.* I do almost no pruning of my own floribundas and climbers, except to remove dead wood, until the night before my annual "Rose Day." Then I cut armloads of flowering branches for decoration in the house, wherever I need to widen the paths enough to let the hordes through. Hybrid teas are pruned moderately. Hard pruning delays June bloom at least a week, and I believe it reduces the life expectancy of a bush.

*Feeding.* One ground feeding of 5-10-5 soon after pruning (lightly stirred into the mulch) is all I can manage. I buy it by the ton, at a cost of less than three cents a pound. I have never had time to test the various samples of special rose food sent me, retailing up to thirty cents a pound, but I doubt if they are worth the difference in price. Subsequent feeding takes no time at all. I add "Ra-Pid-Gro," two teaspoons per gallon, to the pesticide spray every other week.

*Watering.* I do believe in thorough watering about once a week, unless there is sufficient rainfall. My own roses don't get it, but with a mulch they survive anyway, though with somewhat less summer bloom.

*Pest Control.* Being a plant doctor I am quite convinced that spraying as nearly as possible every week from the end of April to the first of November is important. Yet roses live without it. The most important rose bed in my own garden is a "check" bed that has had no pesticide whatever for ten years. Whenever a client claims spray injury, I look at the roses in this bed to see if they show the same abnormality. Then I know it is due to weather and not my spraying.

There are hundreds of all-purpose pesticides now on the market, most of them with formulations too new to have been thoroughly tested. I much prefer spraying for my clients, but if I get into a jam without enough help, as this year, I do some dusting. The only dust I have tested long enough and favorably enough in my own garden to use for clients is Pasheas's rose dust, which I order all the way from Independence, Missouri, from the Glendale Rose Garden. I like this because it contains copper, safe in our hot summers, and ferbam, which makes the dust

(Continued on page 131)

**Two Plant Doctors confer—Dr. P. P. Pirone, Plant Pathologist of The New York Botanical Garden, and the author, Dr. Cynthia Westcott—during the inspection of the Rose Garden on the Fifteenth Annual Rose Day at the Garden**

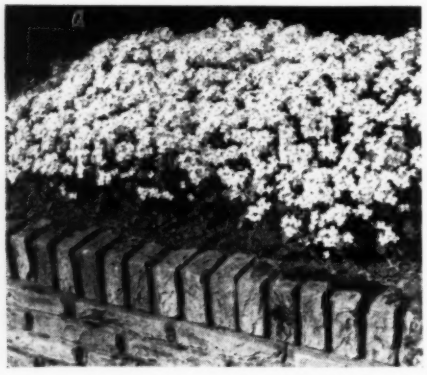
# SOME PLANT NOTES

*By* T. H. Everett

*Hedera Helix*, the English ivy, is one of the most handsome and versatile of evergreen vines. In its many forms and varieties it is useful as a self-clinging vine, a ground-cover and pot plant; its arborescent forms are handsome shrubs. The native range of this species and its natural variants extends throughout most of Europe and to the Caucasus; it is by preference a denizen of woods and forests and appreciates soils that are well provided with organic matter and not excessively dry. In cultivation it thrives in shade, even in deep shade, but it will grow vigorously in full sun, provided the soil is moist and it is not exposed to extreme cold or sweeping winter winds. In North America the most common form of *Hedera Helix* in cultivation is the large-leaved *H. Helix hibernica*, a natural geographical variety that occurs wild in Ireland and Scotland but not in England, and thus might well be called Irish ivy rather than English ivy. There are also numerous horticultural varieties in cultivation. The English ivy is easily propagated by cuttings. Sometimes grafting is resorted to as a means of increasing choice varieties. Seeds germinate readily and may be used to increase the species and its fixed variants.

*Liriope Muscari variegata* is a handsome plant both in foliage and flower. It is rather commonly grown as a pot plant. Few cultivators seem to recognize the fact that it is hardy outdoors in the North, yet this is true at least as far as New York City. Often grown as *Ophiopogon Jaburan variegatus*, this liriope has masses or narrow leaves that resemble somewhat in general appearance those of a coarse grass. The leaves are striped longitudinally with green and creamy yellow. The flowers are violet-blue, are borne in dense spikes, and are succeeded by berries about the size of currants. *Liriope Muscari* is a native of China and Japan. It is very easily propagated by division. It grows in light shade or in sun in any fairly good soil that is not excessively dry.

*Juniperus squamata prostrata* is one of the finest of all ground-hugging junipers; unfortunately it is rare in cultivation. It is very distinct in appearance, forming a low mound or dense contour-following carpet of beautiful green foliage. When planted where it may drape a cliff or rock slope, it is seen to special advantage. When growing on level ground, the branches of this juniper extend horizontally without becoming upright at their tips; the plants increase moderately in height because branches originating close to the base pile themselves on top of older branches and also extend horizontally, thus producing a shingled effect. *Juniperus squamata prostrata* originated from seeds collected by the late E. H. Wilson in western Szechuan and western Hupeh, China; the variety was first described in 1923. This kind is easily propagated by cuttings, grows rapidly during its early years, more slowly later, and thrives in sandy, well-drained soils in full sun. It does not appear ever to flower. Its leaves are all needle-like, scale leaves not being present. The leaves are normally in whorls of three, but occasionally they are produced in opposite pairs.



*Iberis sempervirens*, the evergreen candytuft or edging candytuft, is a well-known and useful garden plant that grows with little trouble and flowers profusely in spring. It is attractive for a fairly long period, and its white flowers blend well with those of tulips, primroses, pansies, and other popular spring border and rock garden plants. A native of southern Europe this species is hardy at least well into New England. The flowers of *Iberis sempervirens*, unlike those of some of the candytufts, are not fragrant; it grows up to a foot high and forms a dense mat of rich green foliage, attractive at all seasons. When in bloom, the foliage is literally hidden by the flowers. This plant grows well in any reasonably good garden soil; it needs full sun for its best development. The species is easily increased by seeds and by cuttings and division; the various horticultural varieties of it, and there are several distinct ones, are multiplied by cuttings and division. The most popular of the varieties are those, such as 'Snowflake,' that are dwarfer and more compact than the type. In some cases, the flowers fade to pink or purple as they age.

*Lobularia maritima* is more familiarly known to gardeners as *Alyssum maritimum* or sweet alyssum, but the former name is the accepted botanical designation for it. No plant is easier to grow, few come to bloom so quickly from seed. Although actually a perennial (not winter hardy in the north), it is almost invariably cultivated as an annual; exceptions are the double-flowered and the variegated varieties which are perpetuated by cuttings and are kept over from year to year. Sweet alyssum is a native of the Mediterranean region. It grows four to twelve inches high and bears white, lilac, or violet flowers in great profusion over a long period. Plants that become straggly may be sheared back, and in a short time they are in full bloom again. This plant needs full sun. It thrives in any ordinary garden soil and succeeds well in those of low fertility. Seedsmen offer selected varieties that breed true; such variations are usually those of compact habit of growth and those having colored flowers. Satisfactory results are had from seeds sown directly out of doors where the plants are to bloom. Plants are sometimes raised early indoors and set out after the danger of frost has passed; this is done when very early flowers are wanted.

*Chrysanthemum nipponicum* enjoys the distinction of being the only hardy truly shrubby chrysanthemum in cultivation. This kind does not die to the ground in winter. In spring, buds along the lengths of the old stems break freely into leaf and growth. This is a very late blooming plant; well after the first frost, it bears its multitudes of large very pure white daisy-like flower heads, each with a golden center. *Chrysanthemum nipponicum*, a native of Japan, is one of the very best plants for growing in seaside gardens; it thrives particularly well near the ocean. Full sun and any fairly good garden soil suit its needs. It makes a rounded bush two to two and a half feet high and has fleshy, smooth leaves. The flower heads are solitary and measure up to three and a half inches in diameter. Propagation is easily effected by means of cuttings, less rapidly by division.

*Orontium aquaticum*, the golden club, is an interesting water plant of the eastern United States where it occurs as a native from southern Massachusetts to Florida and Louisiana, chiefly in the coastal plain region. It inhabits swamps and shallow waters and blooms in spring. As a subject for cultivating in gardens it has much to recommend it, being handsome and easy to grow. Its leaves, which are velvety green above and silvery beneath, float or rise above the water surface; the blades are elliptic, up to twelve inches long, and about one-third as broad as long. The flowers are in tight, slender cylindrical spikes (technically spadices); they are bright yellow. The spikes are supported on white stalks. The golden club may be grown in water six to twelve inches deep. Because it is a strong-rooting species that often is difficult to eradicate once it becomes well established, it is often wise to plant it in tubs or other containers of soil rather than in the soil bottom of small pools. The plant is propagated by division.

*Magnolia grandiflora*, the bull bay or southern magnolia, is one of the noblest of evergreen trees and one of the most magnificent flowering kinds. It is a native of the southeastern United States from North Carolina to Florida and Texas but is cultivated much farther north and is common in Virginia, Maryland, and at Washington, D.C. Even at New York City it may be grown in very sheltered locations, such as against buildings, and will bloom. For many years a very large specimen existed outdoors in a Brooklyn street (and may still for all I know); residents called me up occasionally to tell me of the "big rubber plant" that was growing outdoors in that borough. *Magnolia grandiflora* is beautiful in leaf and in early summer bears huge creamy white blooms in considerable profusion. The flowers are delightfully fragrant. At its best the tree attains a height of almost a hundred feet. Propagation is by seeds, cuttings and grafting.

# THE SAUNDERS PEONY HYBRIDS

*By* **Silvia Saunders**

'Lady Gay' is a quadruple hybrid, ivory with deep rose flares

*continued from May-June number*

IN THE PRECEDING ISSUE OF THE GARDEN JOURNAL, we discussed the hybrids originated by Dr. A. P. Saunders in the shrubby half of the peony kingdom, his so-called lutea hybrids—children of the great flamboyant Japanese tree peonies crossed onto the small wild yellow tree peony from China, *P. lutea*. In this issue we shall take up what appear to be two of the most important of his many originations in the other half of the peony world, the herbaceous peonies.

If we go back and start with ancient history, we find that the same thing happened in the herbaceous as in the tree peonies: centuries ago, the Chinese rescued one lucky species from the wilderness—an ordinary enough little plant, with the usual white or muddy mauveish pink flowers so often seen in the wild. They took it into their gardens, and there it was cultivated, treasured, and "developed" through hundreds of generations of selection and care. The Chinese, and later the Europeans, and still more recently we in America, have made of it one of the glories of our modern gardens. It is still what it has been for over a hundred years, one of our most beautiful and widely loved plants. Tens of thousands of blooms are sold yearly to florists for the cut-flower trade, and thousands of root-divisions are shipped every autumn by the nurseries, at from fifty cents to fifty dollars apiece, to be grown in your garden and in mine.

We now call this species and all its thousands of direct descendants *Paeonia albiflora* or, if you prefer, *P. lactiflora, P. sinensis,* or *P. chinensis*. These Chinese peonies, for such they are, offer a full four weeks of bloom; the flowers range in form from airy singles to huge plump doubles — they're even called "bombs" — and from white through various shades of light and deep pink to old rose and into the crimsons. They are among the hardiest and most easily grown plants that we have. For these reasons, and no doubt also because they are in the gardens of all of us, *albiflora* has served as the "mother plant" in by far the large majority of hybrid originations. Hybrids are usually named simply after their male parent. So that when we speak, for instance, of the "lobata hybrids," we safely take for granted that *albiflora* is the other parent in the cross.

The herbaceous section is rich in species, there being at least thirty or forty that are really separate and distinct. But now our troubles begin, for several of these are themselves large groups and consist of a number of forms or varieties, many of which closely resemble one another, yet are not exactly alike. This situation is not so bad among the species from Asia, but is rather serious among those from Europe. For it appears that in the last Ice Age, some twenty million years ago, which botanically speaking was only the day before yesterday, Europe was covered with ice, whereas Asia was not. Asia's plants are therefore older by quite a span than the European plants, many of which have not yet had time to become settled down and differentiated into separate, well-defined species.

Oddly enough, as far as we know and can judge, the species peonies seem never to have been intercrossed until our own day. We have no reason to believe, for instance, that in our modern albifloras there is any other blood than that of the one original wild *P. albiflora*. It is true that about 1890, several hybrids were produced (we shall speak of some of these later on) but they were few and have not proved important, either as ancestors of other hybrids or as garden plants.

'Queen Rose,' pink and, 'Constance Spry,' cherry-pink, are lobata hybrids

Then a curious thing happened: in 1917 or 18, some five men in America began, quite independently and unknown to one another, to cross *P. albiflora* with *P. officinalis*. Edward Auten, Jr., and the late Lyman Glasscock have each introduced many strikingly beautiful hybrids, including a number of brilliant light reds, some fine "black velvet" reds, and even a few lovely pinks. These plants, in their new colors and fine stature, have made splendid and permanent additions to our gardens. A few hybrids have come to us, too, from others' hands.

Peony growers had long felt that among the albifloras the greatest lack was in the pinks. Yes, there are lovely blush-pinks and some deep rosy ones, then they go into old rose. But there is nothing that could truthfully be called salmon or peach, not to mention coral or cherry—colors so often found among the tree peonies, but entirely absent in the herbaceous. Hybridists, then, were rather on the lookout for a species which, when crossed with *albiflora*, would produce a strain of the beautiful missing pinks. (Yellow, too, is absent, but that is another story.)

Among the wild species, some are white-flowered, but by far the larger number is in muddy mauve-pink or rather violent magenta-purple—colors undesirable from anybody's point of view, and certainly not likely to produce anything resembling salmon-pink. One species offering something better in the way of reds, and even a good pink or two, is *P. officinalis*. Originally from southern Europe, *officinalis* is a

"young" species; it comes in thirty or more forms, or varieties, one of which at least is well known to us all, being the old May-blooming crimson "piney" of our grandmothers' gardens.

Dr. Saunders worked with both *P. albiflora* and *P. officinalis* from the first, and in the course of time, with as many other species as he could lay hands on. Via the botanic gardens in Leningrad and Tiflis as well as others of the continent and the British Isles, and through private collectors of seeds and plants, many species from Asia, the Himalayas, the Caucasus, and southern Europe reached a new home on College Hill. Some very soon found the conditions of life in central New York State not at all to their liking, and perished. Others were heaved out, in whole or in pieces, by our stiff clay in the alternate freezings, thawings, and re-freezings of a normal Clinton winter. Still others proved not to be species at all, but "accidental" hybrids made by air-borne or bee-borne pollens in the nurseries from which they had come; they were sterile, and were eventually heaved out by the hand of man. In due course however, Dr. Saunders did manage to collect pretty nearly all the peony species, and within a few years he had enough hybrid strains coming along to keep time from hanging heavily on his hands.

One of the many forms of *P. officinalis* is *P. lobata,* which itself comes in a number of varieties, with flowers of bright red or brilliant clear vermilion, and even a rose-pink. Among the lobatas in the garden was one which had come in 1928 from Amos Perry in England. It bloomed on June 18, 1929, and was forthwith crossed onto the albifloras in bloom that week. Dr. Saunders' experience had taught him that crosses involving *officinalis* or *lobata* "took" very poorly, the average yield being usually only two, three, or four seeds to a cross. The flowers of "lobata Perry," as it is known in our records, were of a light vermilion color of great brilliance. Hoping against hope that in this vermilion might lie the color break to the fine pinks, and determined to by-pass lobata's natural stinginess in the production of seeds, Dr. Saunders made, that June, one hundred and eighty-nine crosses between "lobata Perry" and various albifloras. What was his astonishment to harvest in August and September more than three thousand seeds! About sixteen seeds per cross! And that was not all, for with prodigality of seed-setting went prodigality of germination. Some twelve hundred little plantlets—and forty per cent is an extremely high ratio in the annals of peony hybrids—were set out from the seed beds two years later. And in 1934 and 35, when these came into bloom, amazement gave way to ecstasy as we found that they were, every one, in glorious reds and heavenly pinks, all entirely new to the peony world, and with never a bad shade among them. Here were palest salmons, peach, rose-pink, coral and cherry in profusion, fine light scarlets and brilliant cerise-crimsons. Many of these open deep, then pale off, so that a mature plant may bear fifty blooms in varying shades of deep and pale pink, but there is no clashing, and the crimsons never turn purple. The forty or fifty finest were, over the course of years, selected, propagated, and offered on the market. Names such as 'Janice,' 'Laura Magnuson,' 'Alexander Woollcott' and 'Carina' are well known.

These lobata hybrids follow the rule for first generation hybrids: they are sterile. But among the F-2's (seeds from any F-1, set by nature without any hand pollinating) is the beautiful creamy yellow 'Moonrise,' in color harking back to who knows what ancestor? And I believe owners of lobata hybrids will be well advised to gather and grow whatever seeds their plants may grudgingly yield to them.

And this brings us to the last hybrid strain of our present story, actually the most recent in this nursery. Native to the Caucasus region are four species over which we must pause a moment, for each is in its own way distinct, beautiful, and important. One is white, one crimson, and two are pale yellow. All are very early-blooming.

The white is *P. macrophylla,* the big-leaved peony; this is well named, for its very leaflets are the largest in the entire peony genus, often measuring 9x12 inches. They are coarse, highly glossy in texture, and in the sunlight give off a strong odor of English box. The flowers are small and creamy white. The famous hybrid, 'Chalice,' is of the cross *albiflora* by *macrophylla.* Our second species, *P. tenuifolia,* is almost *macrophylla's* exact opposite: its leaves are the smallest in the peony world, ferny, even asparagus-like. With its little crimson blooms, it is familiar in the gardens of many of us as a delightful small harbinger of spring.

The names of the two remaining species are tongue-twisters: *P. Wittmanniana* and *P. Mlokosewitschii;* but I beg you, if you do not already know it, to learn the second of these, even if

*Paeonia Mlokosewitschii* is blooming with *Narcissus poeticus* in mid-May

only as "Mloko" or, as Mrs. Francis King used to call it simply, "Mlo," for it is not only one of our most beautiful peonies, but one of the loveliest of garden plants, and though not always sure to succeed, it should at least be tried in every garden.

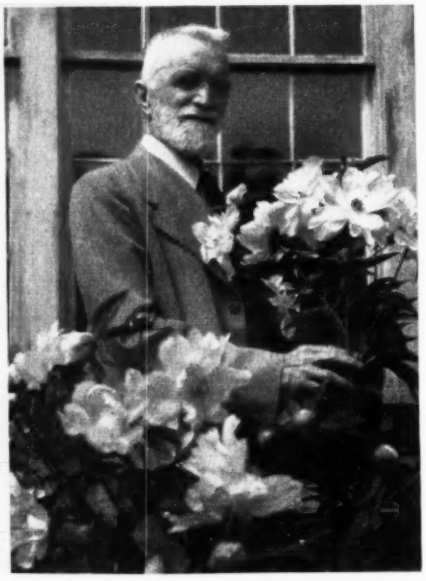
*Wittmanniana* was one of the two or three species used by hybridists previous to 1917. Victor Lemoine crossed it onto *albiflora* and produced four charming early-flowering plants, of which 'Le Printemps' and 'Mai Fleuri' are perhaps best known. Their flowers are pale tea-rose with a sort of café-au-lait cast.

*Wittmanniana* and *Mlokosewitschii* are both pale yellows and as such seem to offer our best hope of producing a strain of double yellow hybrids. 'Wittmann' is of a delicate constitution and the less desirable of the two species; its flowers are paler, and the whole plant much less distinguished. Even including Lemoine's, there are few Wittmanniana hybrids in existence, for it is hard to make consistent use of a plant that is forever dying off and having to be replaced.

"Mloko"—if I may have your permission—is a dream of a plant. Its leaves are a jade-grey-green, gently reminiscent of the eucalyptus, and unique in the peony kingdom. Its stems are often purple-crimson. Its flowers are a pale but perfectly clear saffron-yellow, and they have a spicy odor—is it of cloves? I know of nothing more lovely than a group of "Mloko," with poeticus narcissus planted among them, all in flower together in mid-May. What may we not hope for, exclaims the hybridist, if we can but combine "Mloko's" exquisite qualities with the doubleness and greater hardiness of the albifloras! Alas! With all her beauty, her ineffable aristocracy gets the better of her—and of us—"Mloko," we must confess it, is a snob. She turns up her nose at whomever we may select for her, crosses but grudgingly with any other species at all, and will flatly have nothing whatever to do with our happiest choice for her attentions—*albiflora.*

With high hopes, Dr. Saunders began to cross "Mloko" onto a good many other species. He did, it is true, get a few hybrid plants. Particularly he crossed it onto *albiflora*—and got nothing. I suppose he made in all some five hundred Mloko-albiflora crosses over a number of years without getting as much as one hard hybrid seed. Finally his patience came to an end, and he decided on a flank attack.

Dr. Earle B. White of Washington showed, as Dr. Saunders himself said, "far more determination than I." He made five hundred crosses each year for



Dr. A. P. Saunders was eighty-four years old when this photo was taken in June 1953, as he stood by his hybrid peony 'White Innocence'

eight years, faithfully and steadfastly putting pollen of "Mloko" onto the pink *albiflora* 'Mons. Jules Elie.' With the same results. Finally in the eighth year, he got one hard seed, which grew up and in due course came into bloom and is now on the market under the appropriately lovely name, 'Claire de Lune.' It has charming single flowers of pale ivory-yellow, and is altogether a hybridist's triumph.

Among the happy few on which "Mloko" does cast favorable glances, are two that we have mentioned as coming from its own home grounds—*P. tenuifolia* and *P. macrophylla.* We had had "Mloko-macro" hybrids in the garden since pretty early days. Fortunately these hybrids are fertile in their first generation, so their pollen had been crossed onto various other species. On *officinalis* it took with fair ease, producing a triple hybrid: "Mloko-macro-officinalis." Dr. Saunders then crossed this triple hybrid onto *albiflora,* which he called his "backstairs method of bringing "Mloko" and *albiflora* together." The resulting quadruple hybrids began to come into bloom, some one hundred and twenty-five of them, in 1943, and are proving to be a wonderful and unique group of plants.

Not only is "Mloko" chary about having children at all; she is as niggardly with her pale yellow as *P. lutea* is prodigal with her gold. We have a number of different groups of hybrids in which "Mloko" has had her unwilling share, but not one of her children has ever matched her in yellow. There are pale ivory-yellows and deep cream colors, but no clear, pure, true yellow such as her own. Nor has she been more generous in the matter of foliage; no trace of the rounded leaf nor of the jade-grey coloring is found in later generations. The Quadruples, which bloom the latter part of May, do introduce, at least in their flowers, a new color scheme and new texture. Predominantly pale golden-ivory with a sort of opalescent sheen, they are sometimes blended, often deeply rosy-veined; some even have bright flares like a tree peony. These hybrids are remarkable for great vigor and robustness. Of this strain, 'Starlight' is earlier than Dr. White's 'Claire de Lune' but closely resembles it in color. 'Firelight' is a deep pink; 'Lady Gay' is an ivory with deep bright flares.

There are, of course, many other hybrid strains from species even rarer and less well known than those I have mentioned. *P. Coriacea* gave rise to a group called the Lavender Strain, for its flowers are a lovely pure pale lilac shade. *P. Emodi,* the little species from the Himalayas, has given us 'White Innocence' and the 'Windflowers,' all beautiful garden plants. Still other hybrids—who knows?—may find their place of honor as ancestor of some yet unborn and complex hybrid peonies of the future. And in attempting to introduce my readers to some of the pitfalls in the path of the hybridist, or at least of that one hybridist whose work we have been studying, I hope I have shown, too, some of the peaks—the highlights of a lifetime of happy and devoted work on the genus *Paeonia.*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# EWING PARK LILAC ARBORETUM

*By* **Paul L. Sandahl**

*Syringa oblata dilatata* in full bloom. The wind was blowing thirty miles an hour when this snapshot was taken.

UP TO NOW it might be said that the City of Des Moines and its environs have been peopled with those known as retired farmers and the extraction of retired farmers. This is evident in the livable homes, in the love of nature, and the yen for beautiful things in gardens. It is this influence which has brought about many of the features which make the area a nice place in which to live.

The Lilac Arboretum in Ewing Park, Des Moines, is the realization of the fair dreams of inspired individuals of the community, as well as the consummation of periodic efforts by other such citizens during a number of years. At one time a small collection of lilacs was started in Union Park but was removed a few years later—in 1921, to be exact—because it was thought by some to be a "protection" to certain nocturnal activities of young people which were not "according to Hoyle." Then, with the advent of the Permanent Park Board through state statute in 1931, very definite action was taken by the Board to establish a lilac collection which might become permanent. About twenty varieties were planted in a beautiful location in Greenwood Park in the fall of 1932. A few varieties were added in 1933, but it was recognized immediately that the available space in Greenwood Park would be woefully inadequate for a satisfactory collection of good lilacs, so the project rested for a while and the bushes grew into their well-known natural beauty. During this time a conscientious study of the project was made by the Board; each park was given a good combing as to location, soil conditions, and accessibility. The proper answer did not appear at once.

Early in 1938 the Park Board came into possession, through gift, of the three hundred and fifty-seven acre farm and home of Mrs. Winnie Ewing Coffin, a lover of lilacs and peonies and a patron of all the arts. This gift was made in memory of Mrs. Coffin's parents, Mr. and Mrs. David Rittenhouse Ewing, and specifically for recreational purposes. This, of course, was the ideal solution to all the problems, because the thirty acres immediately surrounding the home site would lend itself fully to the growth and exhibition of lilac plants. That area was set aside by the Park Board for a lilac collection to include the best varieties and those appreciated by the general public, but not to be a fully scientific or botanical collection. The ground slopes to the south and to the west providing good drainage and free air circulation; there are some scattered trees throughout the area, and a big grove of trees where the home buildings were formerly located. The soil is very good for lilacs—a clay loam of alkaline reaction and in sod for many years previous. The Arboretum itself is located a half mile beyond the south city limit.

During those waiting years consistent progress was being made in getting plants of the best varieties started in the nursery of the Park Department so that by the time the old dairy barns and buildings were removed and general clean-up accomplished, a number of good plants were ready for transplanting into the Arboretum. In the meantime a planting plan was developed by the Superintendent of Parks which was to be the nucleus of the further fully developed Arboretum. This plan indicated, more or less, the central section of planting with arrangements for future extension in all directions and with consideration given for special features to be properly placed. Planting according to this plan was begun in the fall of 1943, when one hundred and fourteen different varieties were planted in their permanent locations. Many other varieties were added in 1944, and each year since a few kinds have been added and adjustments made. The plants were placed along broad grass paths which follow ground contours closely, making for as easy walking as possible for visitors. Plants were arranged in groups of three of the same variety in varying triangular shapes—the plants were set ten to eighteen feet apart and the groups at varying distances, according to landscape value and exposure.

In the spring of 1947, many of the lilacs were in bloom, and it was necessary to open the area to that portion of the public which is made up of garden clubs and flower-minded people who are always interested in the development of such a project. In other words, the Arboretum was opened to the public without special publicity—people just couldn't wait! The intense and wide-spread interest in the project, as well as the broadening influence and potentialities of such a flowering collection in this part of the country, were recognized by the Park Board. In a very short time arrangements were made to engage the services of John C. Wister of Swarthmore, Pennsylvania, to plan the Arboretum in its entirety and to direct its development for a period of years. Well—anybody who knows Mr. Wister knows what a perfectionist he is and can understand what a program of "doing things" the Park Department was subjected to right from the start. It has been a very fine relationship as well as education.

The Arboretum in its present degree of completeness—for, of course, it is always complete but never finished—includes one thousand four hundred and sixty-seven plants in one hundred and ninety-five varieties of lilacs, a number of varieties of flowering crab-apples, some witch-hazel, and euonymus. One path is devoted to the chronological presentation of lilac varieties according to their originators; an "historical" path shows varieties which mark the different and progressing stages of evo-

Grass paths, cut shorter than surrounding area, serve to guide visitors as they walk among blooming lilacs

lution from the old lilac to the present gorgeous thing that it is. The early flowering varieties are in a broad group which borders several paths, and there is a path of late flowering sorts. A park drive skirts the lower edge of the whole area, and along the side of the drive and opposite the Arboretum are being developed and planted great sweeps of native wild crab-apples, hawthorns, and wild plum trees. An interesting viewing tower has been erected on the highest spot of the Arboretum, and large parking lots are available near the entrance. A highway borders the area on one side, along which are several entrances through the fence to accommodate pedestrians only. This gives easy access for the people who come too late for the parking yard and must line up along the highway. A shelter house with sanitary facilities is to be built on an advantageous location, commanding a view of the City of Des Moines and beautiful countryside.

Practically no grading was necessary except in establishing the park drive and some shallow smoothing out in small spots. This condition was probably the result of the area having been in pasture for many years. At any rate, it is a very satisfying impress upon the naturalness and peacefulness of an Iowa landscape.

It was originally decided not to feature any kind of flower that blooms at the same time as the lilac, because it would simulate too closely the applause which sometimes occurs after the singing of the Lord's Prayer. It is the hope, however, to have a good showing of wild plum, hawthorn, and crab-apple just preceding the blooming of the lilacs.

A few of the older varieties of lilacs, and others which have been superseded in one way or another are slated for discard as newer varieties become available. Each year a special effort is made to check and verify varietal names to avoid any deviation from correctness.

Each group or variety is labeled on the path side, and each individual plant has a copper label attached to it with copper wire. The variety label has been very satisfactory—a galvanized name plate, two inches by four and a half inches, clinched to the end of a No. 9 wire, thirty inches long (from L. D. Baker Nursery, Kendaleville, Indiana). The name is written on the plate with black grease pencil, which is very enduring. The free end of the wire is pinched to a bend of not more than three quarters of an inch by means of pliers and is plunged into a paper cup filled with soft concrete. When the concrete hardens, the label is "planted" at the proper place to a depth of six or eight inches. Once in a long while the workmen find a label all mashed together and twisted, betraying someone's futile effort, but none has been lost without having been cut off with wire cutters.

All plants in the Arboretum must be on their own roots; if they are not, when they are received, they are planted in the city nursery where they are grown on and checked for trueness to name. At the beginning of preparations for the Ewing Arboretum, when looking for true-to-name, good lilacs, over one hundred varieties were purchased as "slips" from Vivian Evans who was growing a fine collection on her farm home about twenty miles away. All of these, of course, were on their own roots; and after being verified as to varietal name, most of them were planted in the Arboretum.

If a visitor were to enter the Arboretum any time after blossoming time, he might look for the grass paths and not find them—because of the method of maintenance. As soon as the blossoms

A section of the Ewing Park Lilac Arboretum in Des Moines, Iowa

have faded and have been removed from all the bushes, the paths are not mowed again in their special way during the rest of the season. From the time the grass greens up in spring, they are cut to a height of one and a quarter inches with reel mowers, while the balance of the area and around the bushes is cut with farm sickle mowers to a height of three to four inches. Thus, at blooming season, the grass in the paths is shorter than it is in the surrounding part, and the paths supply that gentle leading so easy for humans to follow. Those visitors who like to smell the flowers or want to go crosswise of the paths are not in grass longer than three or four inches, and the area, as a whole, presents the picture of a beautiful green carpet. After the "show" is over, these paths are aerified, fertilized, topdressed, and mowed the rest of the season—along with the surrounding territory — with sickle mowers at the three or four-inch height. This gives the grass in the paths ample opportunity to resuscitate before winter. This method of caring for the grass keeps it in good condition and ready for the "show" each year, and the paths always stretch out a lush welcome to the visitor.

# LILACS

| *Single* | | *Double* |
|---|---|---|
| | I. WHITE | |
| Vestale | | Edith Cavell |
| Mont Blanc | | Alice Harding |
| Marie Finon | | Ellen Willmott |
| | II. VIOLET | |
| De Miribel | | Marechial Lannes |
| Cavour | | Violetta |
| | | Henri Robert |
| | III. BLUISH | |
| Pres. Lincoln | | Maurice Barres |
| Decaisne | | Olivier de Serres |
| Firmament | | President Grevy |
| Diplomate | | |
| Crepuscule | | |
| Boule Azuree | | |
| Moonlight | | |
| | IV. LILAC | |
| Jacques Callot | | Henri Martin |
| William C. Barry | | Victor Lemoine |
| | V. PINKISH | |
| Charm | | Katherine Havemeyer |
| Lucie Baltet | | Belle de Nancy |
| Macrostachya | | Mme. Antoine Buchner |
| | | Virginite |
| | VI. MAGENTA | |
| Capitaine Baltet | | Paul Thirion |
| Congo | | Paul Deschanel |
| Mme. F. Morel | | Mrs. Edward Harding |
| Reaumur | | |
| Glory | | |
| Priscilla | | |
| | VII. PURPLE | |
| Ludwig Spaeth | | Adelaide Dunbar |
| Mrs. W. E. Marshall | | Stadtgartner Rothpletz |
| Pres. T. Roosevelt | | |
| Night | | |
| Toussaint L'Ouverture | | |
| Rochambeau | | |

No doubt a collection of any blooming plant would have similar effect on normal people, but here, in the middle of the country, lilacs seem to be so entangled with the hearts and memories and hopes of everybody that they are universal favorites. Sitting on a park bench in the shade of a tree any place in the Arboretum, one can watch the little folks approaching with their parents. As soon as they catch sight of the broad expanses of green grass, they take off and run just as far as they can, then fall down and roll along a gentle slope. Then they wait at the path to tell their "mommie" how far they "runned." The teen-agers go hand in hand, staggering in fun against each other and closely evaluating the shady spot at each clump of lilacs, as they hunt the best place to sit down and "talk it over." The young married adults, with sweet little cherubs in their arms, teach them to smell the pretty flowers; and they themselves clasp hands occasionally in silent memory or communion. The middle-aged come with camera and notebook; they separate only when he wants time to take a picture and she wants to get the name of "that one right over there." Then come the champion of all comers—a group of all ages from the tiniest to grandma who uses a cane. She surely is great-grandma to the youngest. Her thought is filled with rich memories as she quaffs the fragrance of lilacs and insists on walking a little farther. Some of the group take a gander here or there, and the children dart from place to place, but all move along with grandma as the center. Resting on a bench for several minutes, she says, in an appreciative and gleeful chuckle, "I wish I could live right here!"

* * * *

At the request of the Editor, John C. Wister furnished the following additional notes on the Ewing Park Lilac Arboretum:

The outstanding feature of the Ewing Park lilac collection is that the groups of plants in the meadow land are spaced well apart. This gives visitors a chance to see the whole plant or the group of plants of one variety from quite a distance as well as close to. It avoids the crowded effect of collections which do not have the ample room afforded here.

The varieties are placed to bring out their different colors, the bluish varieties contrasting with the pinkish ones, and the light varieties offsetting the darkest ones. Many groups of white lighten and brighten the whole. Some of the prominent varieties are listed above.


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**THE NEW YORK BOTANICAL GARDEN**
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# A NOTEWORTHY EUPHORBIA

*By* **Rose B. White**

ANYONE INTERESTED IN collecting exotic plants with great beauty of form rather than flower should look into the possibilities of the succulent euphorbias. A group made up solely of this one family can contain tree forms with smooth, reddish bronze branches tipped with green leaves *(Synadenium Grantii)*, tall spirals with wavy edges decorated by a thorn pattern of paired spines *(Euphorbia similans,)* small, round balls lined with checkered markings *(E. obesa)*, and a recumbent type, *E. Càput-medùsae*. This is one that has intrigued me for the past few years.

*Euphorbia Càput-medùsae* was discovered around 1700 by the early Dutch explorers of the South African Coast, when no expedition was complete without its collecting botanist. Thus it was introduced to the Botanic Gardens of Amsterdam where Linnaeus later found it. He gave it the picturesque specific name of *Càput-Medùsae*, descriptive of its numerous slender arms extending at all angles from a central head. If one recalls his Greek mythology, it will be remembered that Medusa was one of three terrible goddesses, known as the Gorgons. Her hair was entwined with serpents and her body was covered with scales. All who looked upon her were turned to stone until Persus, the son of Zeus, cut off her head and brought it to his benefactor, the King of Seriphos. Here the myth ends, but a colorful addition has been made to it by some unknown botanist with a vivid imagination. Persus, returning with his prize to Seriphos, flew across the southernmost tip of the African continent, and the drops which fell from the bleeding Head of Medusa on to the African sands took root and grew into the new clusters of writhing snake-like branches, which have produced *E. Càput-Medùsae*.

The plant lives up to its background by being quite unique in its reproduction pattern. Seeds always produce plants with normal heads, but seeds do not set in any great quantity under cultivation. Arm cuttings are more readily available, root easily, and will grow, and grow until they are often twenty inches or more tall with only an occasional side branch, but never forming a head from which new arms grow. Then someone discovered that if one cut most of the top from a rooted arm cutting, soon new growth will be produced at the base, and this will become a normal plant with a central head. It is then removed from the arm cutting and continues to develop on its own roots. Several such plants can be grown in a season, if they are removed so as to be replaced by new growth, and new plants will show up each spring around the original cutting. Also the top that was cut off can be rooted, topped, and made to grow its new plants and so on *ad infinitum*. It is a fascinating process.

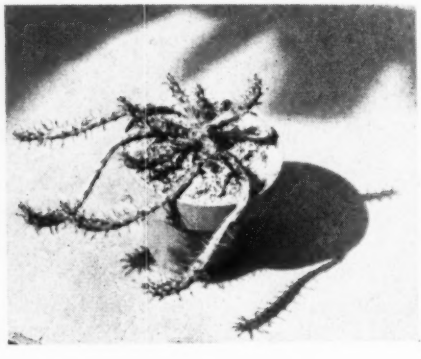
In the past, the tall, rooted branches were put on the market under various names such as *E. Càput-Medùsae* var. *major* and *E. Càput-Commelinii* which resulted in much confusion, even to listing them as new species. Finally, modern botanists identified them all as one type plant through the shape of the broad involucre glands, so that problem was solved.

Mature normal plant of *Euphorbia Bergeri*

Then they applied the same test to another plant, *E. Bergeri*, often called *E. Càput-Medùsae minor*, because of its close resemblance. This did not solve the problem of its origin, however. Here they found the involucre glands to be quite narrow, distinct enough to mark this plant as a new species. The disturbing factor is that no type locality has ever been found for *E. Bergeri*. It was first noticed in the early botanical gardens where it had been grown under cultivation for some time, so they considered it to be a collected African native, but since a rigid search has turned up no others in their natural habitat, it is now believed to be a sport of *E. Càput-Medùsae*. Its arms do not grow quite as long, it does not blossom as readily, and what flowers it does produce are an inconspicuous

Arm cutting of *Euphorbia Caput-Medusae*; its height is thirty-seven inches

Three-year old seedling of *Euphorbia Caput-Medusae*



Normal plant from basal growth of arm cutting of *Euphorbia Caput-Medusae*

greenish white. That is the most distinctive difference between it and *E. Càput-Medùsae*, which has great heads of white blossoms on numerous arm tips each summer.

All of this group much prefer outdoor living; otherwise they develop grotesquely long arms, which seem to sap the strength from the plant and make it susceptible to rot. If kept in the garden in filtered sunshine during the summer, the plants develop into large-headed, sturdy specimens that will bloom consistently each spring (unless they are *E. Bergeri)* and live on indefinitely. Like all succulents, they take a minimum of water, especially in the winter, if kept inside. Here in northern California, I have discovered they much prefer to be left outside throughout the year, even though they are damp most of the winter and subjected to freezing temperatures occasionally, around 24° to 28°. That also applies to *E. obesa.* Both plants, most especially the latter, are easily killed if given more than a bare minimum of water in the greenhouse during the winter, but they flourish if left outside with no protection. Why? I do not know; just another temperamental oddity of this group.

So you see if one species of succulent euphorbias can rate so much interest, a hobby collection of a dozen or a hundred or more different species could be a conversation piece in your greenhouse.

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**LILIES (from page 112)**

almost a specific against that now ubiquitous foliage fungous ailment of plants, botrytis; the nicotine deals with aphis, which are carriers of virus from affected to non-infected plants.

Periodically, one or other of your lily stems will show that the bulb is in distress. The stem topples at ground level or fades out. That can be basal rot, perhaps the single most serious disease of lilies, for which there is only a sanitation procedure. Remove the stem, lift the bulb, and if the affection has not penetrated too deeply, cut the diseased portions out, dust the bulb with "Arasan" or "Fermate," and replant in a new location.

It is useful to know how to protect yourself against the loss of total investment in very expensive bulbs and at the same time to learn how to propagate lily bulbs vegetatively, the only method possible in the case of hybrids which do not come true from seed. Carefully loosen half a dozen scales at the base of the bulb and toss them in a paper bag containing a pinch of "Arasan" or "Fermate." Put the scales on about two inches of sand in a small dish or wooden box, and on top put two inches of moist spaghnum moss. Keep the moss moist and put the utensil in a warm place—it can be a dark place. In three to five months, these scales will develop as many as six bulblets on each.

When the bulblets begin to show roots, plant them in a flat, submerging the bulblets into the soil, while leaving as much as possible of the scales exposed to the air. Resume the cover of spaghnum moss. The flat should contain an inch of pebbles on the bottom below the soil and should be well open to drainage from the bottom. To avoid nematode damage, flats of soil previous to planting should be given a formaldehyde drench—one part of the chemical to forty-nine parts of water, two quarts of the mixture for each square foot of flat; cover with wet newspapers for a week or so; stir the soil thoroughly after the smell of the formaldehyde has evaporated. A year may elapse before the bulblets begin to make top growth. But in time, you should have several useful offspring of the bulb you originally purchased.

Like one of those French lesson books which had wide popularity in Queen Victoria's days, entitled FRENCH WITHOUT TEARS, you can have "For Beauty: LILIES" not only without even a suspicion of tears, but with a fair degree of ease and no inconsiderable pleasure. All you need is a touch of garden sense and sensibility.

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**FRENCH BOTANISTS (from page 108)**

a most distinguished pharmaceutical establishment, and Durand contributed many publications on pharmacy, his major interest was botany to which he devoted all his time after his retirement at the age of fifty-eight. His store was a gathering place for botanists. He financed many botanical travelers, made extended explorations in Virginia and the mountains of Pennsylvania, as well as shorter excursions with Joseph Bonaparte and others. He was elected a member of the American Philosophical Society and the Academy of Natural Sciences of Philadelphia.

According to Harshberger, a gentleman of means gave the young Durand, when he left France, funds with which to collect in North America plants which were little known and in great demand. Durand arranged with Rafinesque[4/] to furnish the required collection. Rafinesque, always in need of money, contrived to be paid in advance, and on the very day of the sailing of the vessel which was to take the specimens to France, Rafinesque appeared with bundles of worthless rubbish. Durand was highly mortified at being obliged to send such poor material and determined to make amends by making collections himself. Within a few years he sent to his friend a satisfactory collection of plants.

This experience doubtless accounted, in part, for his interest in herbaria; he collected personally and obtained specimens from other notable collectors of his day. It doubtless influenced also his judgment of Rafinesque. Durand paid forty-five dollars for the herbarium of Rafinesque in 1843 or 1844, after the death of the latter. It had been stored in a stable garret for three years and its condition was described by Durand as "truly a dunghill." He removed it to a cellar and for a winter was occupied by candle-light in separating the good from the rotten.

In a letter to Charles Wilkins Short, written in 1856 about his experience with this herbarium, Durand gives his opinion as follows: "Rafinesque's own specimens were trash, incomplete, good for nothing; he was the worst collector I ever knew." Most of Rafinesque's own specimens were discarded by Durand. Agnes Chase found no Rafinesque specimens among the grasses in the Herbier Durand at the Jardin Des Plantes, and Pennell found only eight out of sixty species of *Scrophulariaceae.*

Durand was an assiduous collector. He sold some ten thousand species to "a wealthy young gentleman of (Columbus) Ohio;" he added many desi-

(Continued on page 132)

4/ Constantine Samuel Rafinesque was born in Constantinople in 1784 of French parentage; came to Philadelphia in 1802; returned to Europe in 1805 with a collection of botanical specimens and returned to the United States in 1815 where he remained. His erratic genius has been the despair and inspiration of botanists.

# BAMBOOS

## *THEIR ECONOMIC FUTURE IN AMERICA*

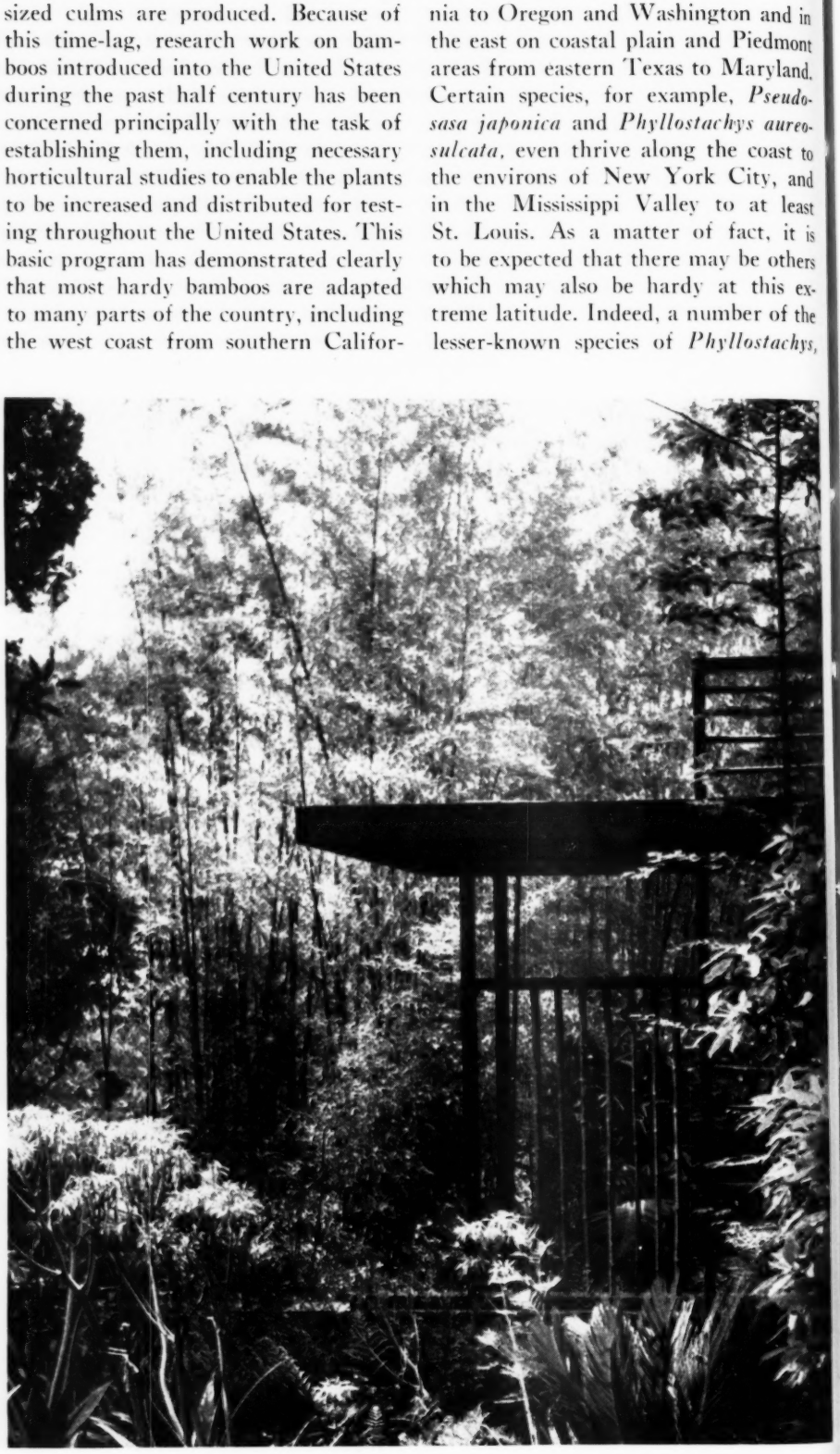
*By* W. H. Hodge

FEW PEOPLE realize that many of the native bamboo species of China and Japan flourish in certain parts of the United States and that in such states as Louisiana, Georgia, and California bamboo groves exist which are over a half century old.

The exact origins of some of the earliest nineteenth century bamboo introductions into this country are not clearly known, but it is safe to say that most species introduced since the turn of the century owe their origin either directly or indirectly to efforts of the Section of Plant Introduction of the United States Department of Agriculture. Plant explorers of that organization, particularly men like Frank Meyer, Barbour Lathrop, David Fairchild, and Floyd McClure, were much impressed with the utilization of bamboo in the Orient and felt that these giant grasses should have potential value for the United States as new economic plants.

Bamboos introduced through the years have been planted at the Department's Barbour Lathrop Plant Introduction Garden, established in 1919 at Savannah, Georgia, principally for the maintenance and study of these interesting plants. Visitors to this Garden will see what represents among the most extensive germ-plasm collections of hardy bamboos anywhere in the world. Principal genera maintained include *Arundinaria, Cephalostachyum, Chimonobambusa, Phyllostachys, Pseudosasa, Sasa, Semiarundinaria, Shibataea, Sinobambusa,* as well as the hardier species of the more tropical genus *Bambusa.* Most strictly tropical species of bamboo that are introduced cannot be grown at Savannah and are maintained at federal field stations at Coconut Grove, Florida, or at Mayaguez, Puerto Rico.

Although bamboos are noted as fast-growing plants, actually a decade may be required for the complete establishment of a mature clump in which full-sized culms are produced. Because of this time-lag, research work on bamboos introduced into the United States during the past half century has been concerned principally with the task of establishing them, including necessary horticultural studies to enable the plants to be increased and distributed for testing throughout the United States. This basic program has demonstrated clearly that most hardy bamboos are adapted to many parts of the country, including the west coast from southern California to Oregon and Washington and in the east on coastal plain and Piedmont areas from eastern Texas to Maryland. Certain species, for example, *Pseudosasa japonica* and *Phyllostachys aureosulcata,* even thrive along the coast to the environs of New York City, and in the Mississippi Valley to at least St. Louis. As a matter of fact, it is to be expected that there may be others which may also be hardy at this extreme latitude. Indeed, a number of the lesser-known species of *Phyllostachys,*



The ornamental value of one of the hardy bamboos, Bory bamboo, *Phyllostachys nigra* (Lodd.) Munroe, as shown in a Los Angeles garden

The utility of home-grown bamboo on a small farm is shown here by its use in the vegetable garden. The short branch stubs on the bamboo poles made it possible to support tomato plants without tying them.

although already growing in the United States, have yet to be tested for ultimate hardiness.

Most of the hardy bamboos so far tested grow best where minimum winter temperatures fall between 5° and 25° Fahrenheit, and where there is a good supply of moisture during the growing season. They do not thrive in frost-free climates and, on the other hand, are injured or killed in colder ones. As opposed to most of the species of the tropics the hardy bamboos have a running habit, their underground rhizomes extending in all directions ultimately to form large bamboo groves. Tropical bamboos of the clump-forming type are much more tender, only a few withstanding temperatures as low as 16° to 20° F. without serious injury and most being killed back at 26° to 28° F.

Because of their unusual character and beauty the Oriental bamboos introduced up to now have been primarily used as horticultural subjects—as garden ornamentals, for producing isolated clumps or for massing in groves, as hedges, borders or screens. Reflecting this type of use most government publications issued on bamboo to date have had to do with the identity, propagation, and culture of species desirable as ornamentals. That these plants are proving of value is shown by the fact that bamboos may now be obtained from representative nurseries in those areas where they can be successfully grown. In certain cities such as Los Angeles, they garner top prices as landscaping materials and may be found as unusual subjects gracing the show places of the region.

More recently there has been a small but growing interest in the possible production of bamboo culms for some of the utilitarian purposes for which they are noted in the Far East. Since the running bamboos, when planted on favorable sites, increase to form solid groves often measurable in acreage, it is natural that some use should be sought for the excess poles produced annually. The fact that certain species have small-diameter culms while others (the so-called "timber bamboos") yield large-diameter culms makes it possible to supply poles for a wide range of purposes. In the South, many a farmer finds that his bamboo clump has proven an ever-dependable source of lightweight poles and stakes for garden or farm use whether as support for pole beans or for tomatoes, in trellising or fencing, as poles to harvest pecans, or as props for heavily-laden fruit trees. Since a bamboo grove will generally supply more than enough poles for home use, small backyard or farm plantings have also yielded cash income from poles produced and sold for the above-mentioned purposes or for fishing or rug poles, radio masts, home panelling, or general use in handicrafts.

The growing, harvesting and preparation of bamboo poles for commerce

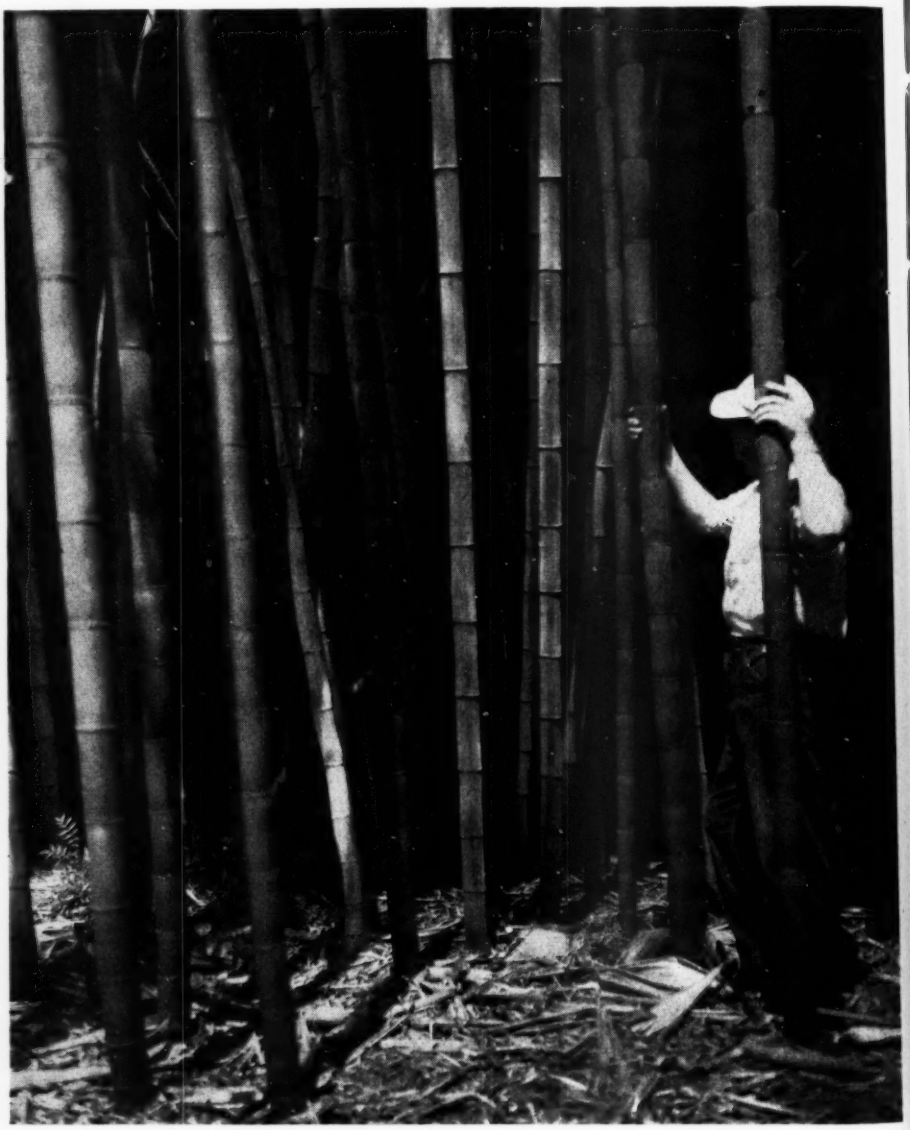
Hardy bamboos undergoing propagation testing at the Barbour Lathrop Plant Introduction Garden at Savannah, Georgia

is quite another thing from using the plants as ornamentals, wherein decorative value is the major characteristic desired. Most hardy bamboos are similar in general growth form and so all species have, to a degree, value for ornamental horticulture. On the other hand, not all hardy bamboos produce culms equally valuable in commerce. Indeed, although the culms of two species may look identical, there may be as much variation in the physical characteristics (tensile, compressive, and flexural strength) of the culms as exists between the wood of say poplar and oak. The prospective grower of bamboo for commerce must thus be familiar with the ultimate use of his poles before deciding which species to plant.

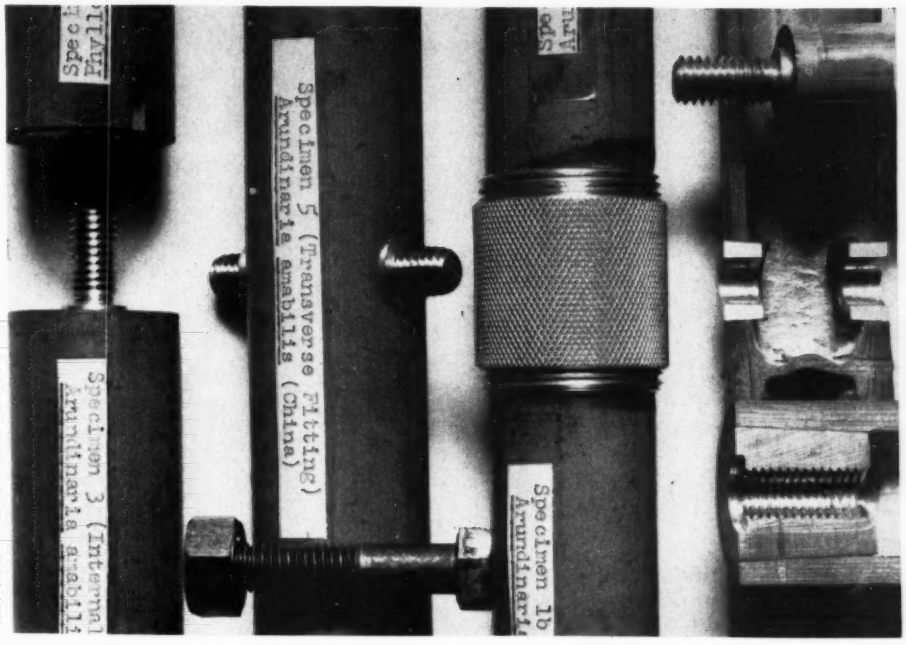
Once a suitable commercial bamboo is selected, planted, and fully established, the grower must learn also the techniques of proper harvesting. Bamboo species, whether they be small, medium, or large in habit, differ from other woody plants not only in that their stems attain full diameter size when only a few inches high but also in that they grow to their full height during a five to eight week period in the spring. But though full growth is made within such a short period, the wood of the newly produced bamboo culm remains comparatively soft during the first two years of its life, the fiber cells being at first very thin-walled and filled with sap. Only during the third year does the wood of the culm complete its hardening through the thickening of the walls of the fiber cells. Thus, not until the end of the third season does a bamboo culm acquire the strength and durability required for commercial use. Bamboo culms must be three years old before cutting for use either as fishing poles or for any other purpose in which physical strength of the culm is important. Without proper seasoning the quality of domestic bamboo poles would fail to compete with imported material produced in the Orient. It has been demonstrated that domestic bamboo (taking species for species) properly grown and correctly harvested is the equal to that grown anywhere.

Despite this fact it is doubtful, at least in the near future, whether domestic bamboos can ever attain in the United States the widespread utility characteristic of these plants in the Far East. Cheap labor, simple living requirements, depleted forest resources as opposed to abundant and quickly renewable supplies of native bamboos, all help to make these giant grasses the all-purpose building and handicraft material in the Orient. Even were the bamboo resources of our country more bounteous, the American craftsman would still have much to learn about how to use this silica-toughened plant material—the best ways to cut and fasten it, the Oriental secrets of nailing, screwing, bending, splitting, and peeling, or the novel methods used by growers whereby bamboo culms are forced to the shape or form desired. It is true that new joining devices, utilizing threaded aluminum plugs, plastic adhesives, and electronic welding may bring about the use of bamboo culms for making sturdy yet collapsible furniture, ladders, sporting equipment, and the like. But it appears that such modern industrial materials as fiberglass, plastics, extruded aluminum, and plywood are already too potent competitors for bamboo and any extensive use it may have in the future in the American do-it-yourself market.

Though its future use in handicrafts may be limited, domestic bamboo, nevertheless, should have great industrial possibilities for the Americas. To demonstrate the potentials of these grasses to industry, particularly in regard to possible chemurgic uses in the United States, the Federal Department of Agriculture has been supporting certain kinds of research on the hardy



**Potential pulp for paper or cellulose: a mature grove of a timber bamboo (*Phyllostachys*) growing near Savannah, Georgia**



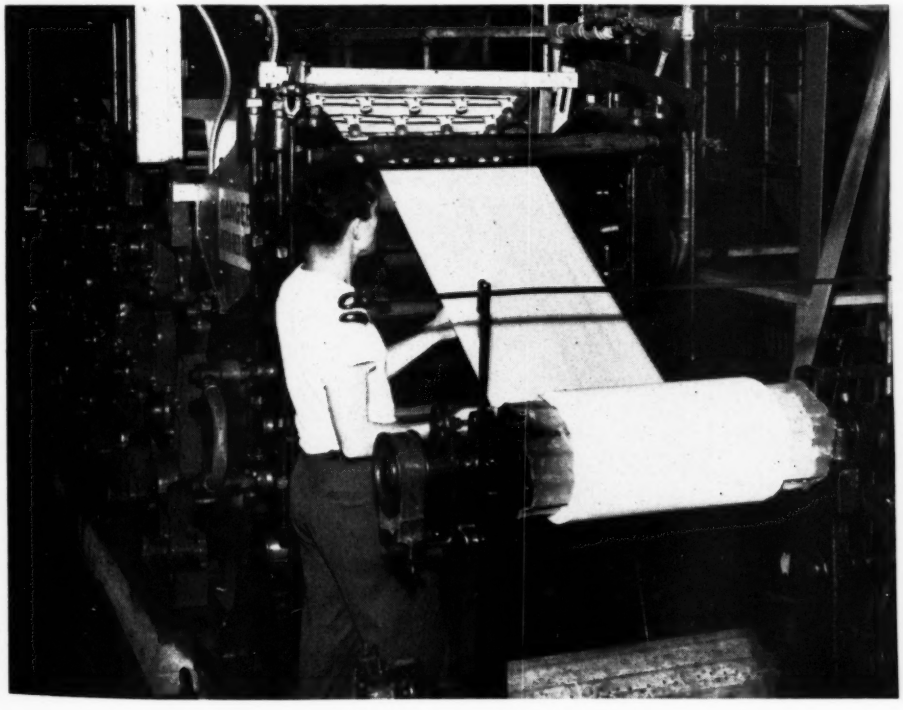

Experimental mechanical fastenings for bamboo poles. Made of aluminum and seated in place by induction heating, they are the modern answer to the ancient problem of fastening together two pieces of bamboo without causing splitting.

bamboos. The first of these research studies was a comprehensive literature survey on bamboo published in 1953 by the Georgia Institute of Technology (Engineering Experiment Station Bulletin No. 18, now out-of-print). This publication brings together in one place important references relating to bamboos and bamboo utilization. As a result of the survey several recommendations were made indicating profitable lines of future research on bamboo. These included the suggestions that 1) a comparative study of the physical properties of the various species of bamboo presently established in the United States be made to determine which kinds should be recommended for specific commercial or industrial purposes; and 2) that an investigation of introduced bamboos be made to find which species might serve as possible new domestic sources of paper pulp.

Based on these recommendations, research was begun on the physical properties of bamboos including studies of tension, compression and flexure of culms of thirty-eight of the most promising hardy bamboos (in the genera *Arundinaria, Bambusa, Phyllostachys, Semiarundinaria,* and *Pseudosasa*) growing at the Barbour Lathrop Plant Introduction Garden at Savannah. Eighteen different tropical bamboos (in the genera *Bambusa, Cephalostachyum, Dendrocalamus, Gigantochloa,* and *Guadua*) obtained from the Federal Experiment Station at Mayaguez, Puerto Rico, were also tested. The purpose of including tropical bamboos in this study was to obtain a general comparison between the physical characteristics of the culms of tropical and hardy bamboos. This research work was entrusted to the Engineering Experiment Station of Clemson College, an institution with previous interest in bamboo gained through studies of bamboo utilization as reinforcing material in Portland cement concrete.

Simple trial and error has demonstrated that certain species of bamboo produce culms superior to others for specific purposes. For example, the Tonkin cane *(Arundinaria amabilis)* has long served the sport fishing-pole industry as the best species for fine split bamboo rods. The culms of the golden bamboo *(Phyllostachys aurea)*, on the other hand, have been accepted and used throughout the South as they come from the plant, as the best ready-made fish-pole.

Clemson College findings, published in 1956 ("Seasoning, Preservative and Water-Repellent Treatment and Physical Property Studies of Bamboo," Engineering Experiment Station Bulletin No. 8), confirm the superiority of Tonkin cane but indicate that other species of this genus, notably *Arundinaria Simonii,* should also be more widely grown and used. On the other hand, the Clemson research indicates that other species of *Phyllostachys,* for example, the little-known Meyer bamboo *(P. Meyeri)*, should produce better fish-poles than the golden bamboo.



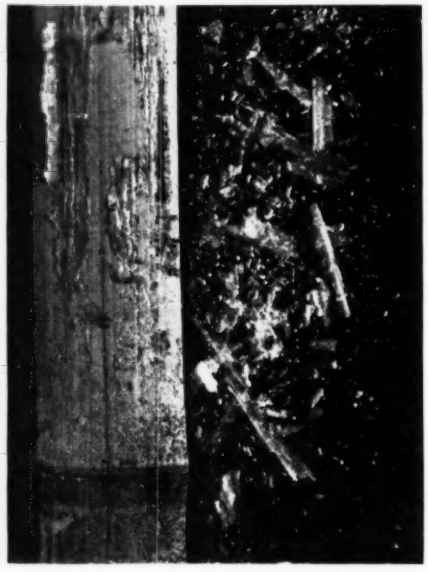
Bleached paper made from *Phyllostachys bambusoides* appearing in the experimental run at the dry end of a Fourdrinier paper machine in the test laboratory of the Herty Foundation

Clemson also investigated the seasoning and absorption of water-and oil-soluble wood preservatives by bamboo culms, studies suggested because of the problem of culm-splitting so familiar to users of whole bamboo poles. In China and Japan where bamboo is an everyday commodity, humid climatic conditions both indoors and outdoors are such that the splitting of bamboo culms is a very minor problem. Not so in the United States where, in our dry over-heated homes particularly, bamboo articles, when made of whole culms at least, are regularly subject to the danger of splitting. The Clemson report points out various methods by which serious cracking can be at least partly controlled.

In view of the serious inroads made on our natural pulp sources, possibly the greatest potential use for hardy bamboo in this country should lie in the production of fiber and cellulose for the paper-making and rayon industries. As pointed out by Floyd McClure, well-known authority on these giant grasses, bamboo has many advantages over standard pulp woods as a source of paper pulp. Among other things bamboo has no bark to be removed; its high specific gravity makes possible a ten to twenty percent increase in the effective pulp capacity of the digester; bamboo fibers, though shorter than those of conifers, are slenderer in proportion to their length, resulting in a versatile pulp yielding superior quality papers; the per-acre-per-year yields of cellulosic material from bamboo (six times that of southern pine!) often greatly exceed those from standard softwood pulp sources; and certain bamboos may be cut repeatedly, over a long period of years, on a short cycle (as little as five years, after establishment of a planting), whereas those who plant southern pine must wait eighteen years for thinning and approximately thirty years for the main harvest.

A high alpha-cellulose content also has been demonstrated in certain of the tropical bamboos. There is little reason to doubt that a similar content exists in some of the hardy bamboos, which might make them interesting subjects for our domestic rayon industry. A possible by-product of bamboo poles grown for pulp or cellulose might be the heavy coating of natural wax found covering the culms of certain species. Natural vegetable waxes are in short supply, and industry would doubtless welcome inexpensive new sources.

Although the commercial use of bamboo as a paper source is but a dream in this hemisphere, these giant grasses have long been used as primary sources of pulp in Asia. Historically, paper originated in China where bamboo was not only one of the earliest sources of pulp but continues today to be one of the chief paper-making materials. What has been for many years



Portion of a culm of the timber bamboo, *Phyllostachys bambusoides*, showing the coating of natural wax, an uninvestigated by-product of possible economic significance

a handcraft in China has evolved elsewhere into a highly mechanized industry, with countries like India manufacturing at present a quarter of a million tons of bamboo paper pulp a year.

In southern Asia, where the main production of bamboo pulp is centered, the great natural forests of tropical clump bamboos are proving to be the chief sources. The fibers of some of these species have a longer average length than those of the hardier running types and so are of more interest theoretically to American paper manufacturers, who are accustomed to the longer fibers typical of pulp conifers. Most of the modern technical literature on bamboo utilization for paper pulp has resulted from industrial activity with these plants in India. Yet the pulping techniques (and agronomic practices) developed for the long-fibered, clump-producing bamboos of the tropics possibly cannot be applied to the shorter-fibered, running bamboos, which alone are hardy in the United States. Thus it may be expected that special studies will have to be made on these hardier species, though certain information is possibly available from those few modern paper mills in China (including Formosa) and Japan, where species of the hardy *Phyllostachys* are pulped. For example, mills in Japan are pulping *Phyllostachys bambusoides*, while in Formosa *Phyllostachys makinoi* is the species utilized. The former species is one of the most promising timber bamboos established in the United States; the latter, recently introduced, is reported to have longer fibers than other species in the genus, but as a native to subtropical Formosa it is likely to prove too tender for widespread culture in this country.

Profitable hints on paper production from *Phyllostachys* bamboo may be best learned in Japan. In 1955 a new Japanese factory started commercial operation turning out fifteen tons daily of bamboo paper of printing quality. Its reported production is based on a sustained yield involving approximately seventeen thousand acres of *Phyllostachys bambusoides*. The unit price obtained for bamboo paper produced by this modern factory is said to be only two yen less than the best quality pine paper produced by competing Japanese paper companies.

Bamboo intended for pulp purposes in Japan is usually grown in mixed forests. Plantings are thus afforded protection against typhoons and early snow damage which are more likely to break down bamboo in solid groves. In the characteristic mountainous terrain of Japan, bamboo has to be grown as hillside plantings and the harvesting of poles for pulp is largly a selective cutting of four-year-old culms. Although strip cutting of bamboo by mechanical means would seem to be a much more economical operation and one to be investigated in this country, Japanese experts have apparently proven to their own satisfaction that such a harvesting technique would continually weaken a bamboo grove, resulting in the production of smaller and smaller culms in subsequent years.

Despite the success that bamboo has had as a pulp source abroad, there has been no real interest shown yet by the

(Continued on page 131)

# A MARTIUS RELIC

*By* J. J. Wurdack

From the mouth of the Rio Tapajoz, the twin-steepled church (center) containing the Martius memento is a conspicuous feature.

TAXONOMISTS BY NATURE or by training are bibliophiles. The rules of botanical and zoological nomenclature induce an attention to exact dates of publication of books dating back hundreds of years; indeed there is a periodical, The Journal of the Society for the Bibliography of Natural History, devoted mostly to this subject. For biological as well as nomenclatural reasons, the consultation of rare and old books and journals is imperative. The exact locality of collection of botanical specimens is often a clue in the identification and interpretation of species. The minute morphological details of species often vary geographically; topotypical (i.e., collected from the same locality as the type specimen) plants are extremely valuable, especially when the type material was incomplete. Thus, apart from the inherent romance of early exploration, the itineraries of the great botanical collectors became a part of botanical research.

While just the experience of visiting a place famous botanically for its previous collecting associations is rewarding, it is only rarely that in situ tangible man-made relics of nineteenth century botanists can be found in South America. In areas still remote from the modern world, the plant species first collected by early travelers persist, but villages change or die. In the upper Orinoco, there are probably fewer people now than during Humboldt's and Spruce's visits in the nineteenth century and certainly fewer towns. At Santarém in Brazil, however, there still exists a direct link to the great explorer, von Martius.

Santarém, in the state of Pará at the junction of the Amazon and Tapajóz rivers, has been a stop-over for all Amazon naturalists. The town was originally a settlement of the war-like Tapajoco Indians and, with the extermination of these aborigines, became a Portuguese settlement in 1661, the namesake—as are many other Amazonian towns—of a city in Portugal. There was a rebellion at Santarém in 1835-36, followed by a bloody Indian uprising; the Brazilian Air Force garrison staged an abortive revolt in February, 1956, with considerably less sanguinary results.

Two youthful German biologists, Johann Baptist von Spix and Carl Friedrich Philipp von Martius, arrived in Brazil on July 14, 1817, their expedition sponsored by the King of Bavaria. During the three subsequent years, they visited southeastern Brazil and finally, together and separately, ascended the Amazon Valley as far as the rapids of Araracoara (on the Caquetá river in southeastern Colombia) and Tabatinga (on the Solimoes river at the Peru-Brazil frontier). During their stay in Brazil, they collected about thirty-four hundred species of animals and sixty-five hundred of plants. Upon their return to Munich, a long series of publications on Brazil was begun, climaxed by the sumptuous *"Flora Brasiliensis."* Martius combined literary quality with scientific competence, his writings being highly praised by Goethe. The three-part *"Reise in Brasilien"* is the Brazilian counterpart of Humboldt's TRAVELS IN AEQUINOCTIAL AMERICA; the narrative paragraphs of Martius are much less dispassionate than those of Humboldt. The first two parts, concerning the extra-Amazonian trips, were translated into English, but the Amazon journey must still be read in German. However, the sonority and grandeur of Martius' paragraphs concerning the Brazilian scenery seem better in the original. Such storm descriptions as *"Wilder goss sich der Regen aus der rabenschwarzen Nacht . . . . Unaufhorlich von allen Seiten schimmernde Blitze, schwer rollender Donner, hohles Brausen der empörten Fluth"* become rather emasculated upon English rendering.

Spix and Martius left Belém on August 21, 1819, for Marajó and the upper Amazon. The entire Amazon

The Santarém waterfront market sells fresh fruit and fish brought in by small paddled dugouts or sail boats with colored sails.

The Santarém streets are typical of many small Amazonian towns

trip was punctuated by stormy weather, near-shipwrecks, and seasickness. The relief that the travelers experienced upon arrival in Santarém on the morning of September 19 can be fully appreciated by anyone who has journeyed in small boats on the lower stretches of any of the large South American rivers during the dry season; then the combination of low water, wind, and tide produces waves worthy of the open sea.

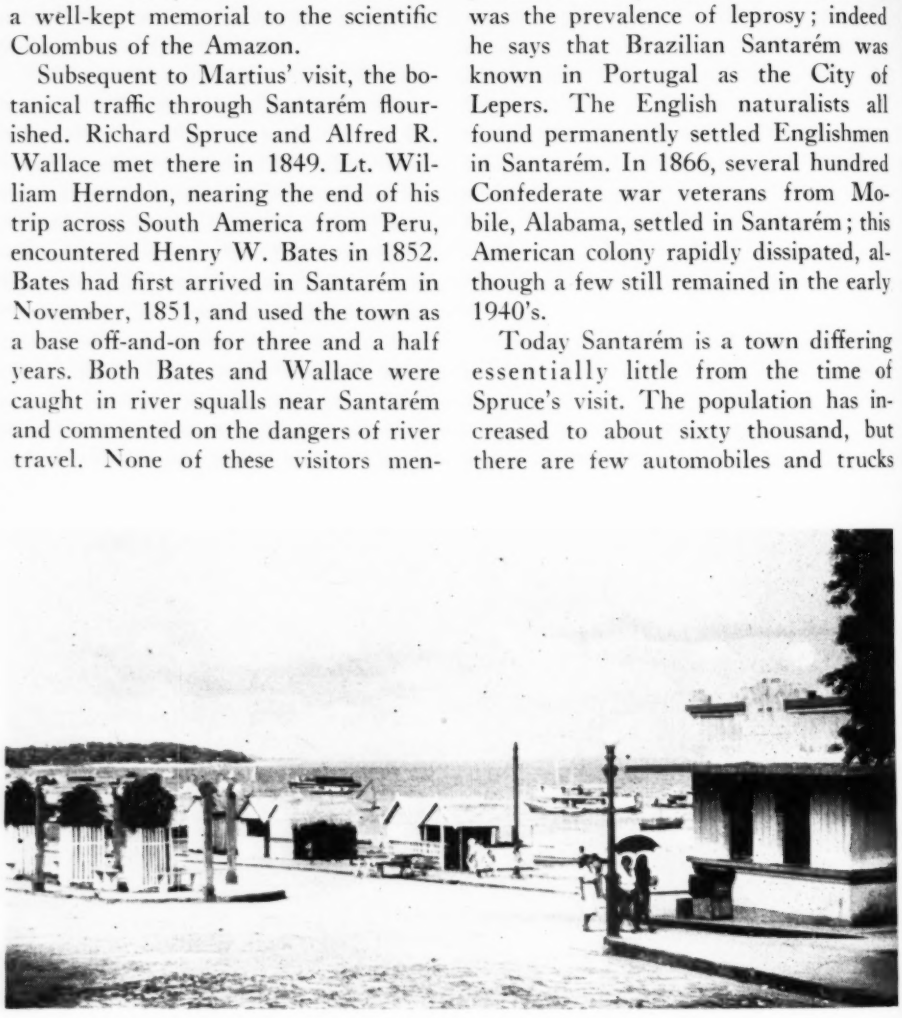
Upon returning from the upper Amazon in March, 1820, the explorers had another perilous passage with an inexperienced pilot through a storm just above Santarém. "At the height of the waves and dense mist, which during several days rain had hidden the river banks, it was difficult and dangerous to reach near the south shore an island surrounded by sandbars. From here, however, we fortunately reached the city through the Igarapé-açu channel which goes from the Amazon into the Tapajós."

Upon returning to Germany, Martius fulfilled a vow made during a stormy river passage and had a religious figure made for the Santarém church *Nossa Senhora da Conceiçao*. Strangely enough, although both the explanatory plaque and Agassiz stated that Martius' miraculous escape from death occurred on September 18, Martius himself did not mention, in the narrative of the first Santarém visit, the circumstances surrounding the escape, an omission made more striking by the many storm experiences described elsewhere in the *Reise*. The statue and explanatory plaque were installed in the church in 1846. During World War II, the statue was renovated and today stands in Santarém as a well-kept memorial to the scientific Colombus of the Amazon.

Subsequent to Martius' visit, the botanical traffic through Santarém flourished. Richard Spruce and Alfred R. Wallace met there in 1849. Lt. William Herndon, nearing the end of his trip across South America from Peru, encountered Henry W. Bates in 1852. Bates had first arrived in Santarém in November, 1851, and used the town as a base off-and-on for three and a half years. Both Bates and Wallace were caught in river squalls near Santarém and commented on the dangers of river travel. None of these visitors mentioned the Martius statue. Louis Agassiz, however, on January 23, 1866, made a special point of visiting the church to view the statue and plaque; as a twenty-year-old student, he had been associated with the German count many years earlier, identifying Martius' Brazilian fish collections.

Santarém at the time of Bates' and Herndon's visits had a population of twenty-five hundred to five thousand. It was a center for Amazonian commerce and the starting point for the Tapajóz-and-overland route to southern Brazil. Bates was much taken with the agreeable climate, lack of insect pests, and beautiful setting: "After traveling week after week on the main river, the aspect of Santarém with its broad white sandy beach, limpid dark green waters, and line of picturesque hills rising behind over the fringe of green forest, affords an agreeable surprise." The only drawback Bates found was the prevalence of leprosy; indeed he says that Brazilian Santarém was known in Portugal as the City of Lepers. The English naturalists all found permanently settled Englishmen in Santarém. In 1866, several hundred Confederate war veterans from Mobile, Alabama, settled in Santarém; this American colony rapidly dissipated, although a few still remained in the early 1940's.

Today Santarém is a town differing essentially little from the time of Spruce's visit. The population has increased to about sixty thousand, but there are few automobiles and trucks



The small waterfront plaza in front of the church is a popular daytime meeting place and the social center at night

O CAVALLEIRO CARLOS FRED. PHIL. DE MARTIUS,
MEMBRO DA ACADEMIA R. DAS SCIENCIAS DE
MUNICH, FAZENDO DE 1817 A 1820 DE ORDEM
DE MAXIMILIANO JOSÉ REI DA BAVIERA UMA
VIAGEM SCIENTIFICA PELO BRAZIL, E TENDO
SIDO AOS 18 DE SETEMBRO DE 1819 SALVO POR
MISERICORDIA DIVINA DO FUROR DAS ONDAS
DO AMAZONAS JUNTO A VILLA DE SANTAREM,
MANDOU, COMO MONUMENTO DE SUA PIA
GRATIDÃO AO TODO PODEROSO, ERIGIR ESTE
CRUCIFIXO NESTA IGREJA DE NOSSA SENHORA
DA CONCEIÇÃO, NO ANNO DE 1846
Pae nas tuas maos encommendo o meu espirito

The statue given by Martius stands in a side alcove in the Santarém church. The explanatory plaque translated reads: "The nobleman Carlos Fred. Phil. de Martius, member of the Royal Academy of Science of Munich, by order of Maximiliano Jose King of Bavaria made a scientific trip through Brazil from 1817 to 1820 and, having been saved by Divine Compassion from the fury of the waves of the Amazon near the town of Santarém on Sept. 18 of 1819, ordered erected, as a monument of his pious gratitude to the Almighty, this crucifix in this church of Our Lady of the Immaculate Conception in the year 1846."

to be seen. Bates' favorite savanna is partially occupied by an airfield. Many of the river boats are still powered by sail or paddle. Santarém is the principal river stop-over between Belém and Manaus; from there also, air routes lead to Belém, the upper Amazon, and Rio de Janeiro. Unfortunately, the brief air-stops have obscured for transients the inherent appeal of the city as both a typical small river town and one with an important association in botanical history. To linger there a few days is to recapture the romance of nineteenth-century exploration.

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**BAMBOO** (from page 128)

paper industry in this country. Believing that this disinterest may be due to lack of basic technical information on the hardy bamboos, the Department of Agriculture has recently been subsidizing research studies on the more promising species now established in the United States. One of the first of these was an investigation of the comparative fiber lengths of approximately forty introduced bamboo species of possible interest as new pulp crop plants. This research was contracted with the Herty Foundation of Savannah, Georgia, a non-profit private laboratory specializing in research for the paper industry.

Later studies by this institution have been concerned with the pulping properties of hardy bamboos. The pilot plant of the Foundation has been used to determine whether bamboo as a new source of paper pulp can compete cost-wise with southern pine. Many experimental lots of bamboo paper have been made at the Herty Laboratory and they indicate very clearly that excellent quality paper can be manufactured from domestic bamboo. Moreover, the qualities of this paper are such as to make bamboo worth considering for a number of special-type papers, which cannot be readily or profitably made from present domestic pulp sources.

With favorable information of this type in hand, Federal and State agronomists are now developing the long-term agricultural research program that is required to determine what practices and techniques are needed in order to grow hardy bamboo for industrial use. Only with such information in hand can encouragement be given to the general public among whom will be the American bamboo-pulp producers of the future.

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**ROSES** (from page 113)

inconspicuous on the foliage, for diseases; rotenone for aphids; lindane for thrips; and, for red spiders, aramite which, in my experience, is a better miticide than malathion. The dust mixture does contain some DDT but a relatively low amount. I do not use DDT in a spray for clients unless vitally necessary for midge or leafhoppers. I continue to use the old-fashioned "Tri-ogen" which contains lead arsenate for chewing insects, pyrethrum and rotenone for aphids, copper and ferbam for diseases. I ask for it without a miticide and add aramite every other week from May first to the middle of August. The copper usually controls mildew but for stubborn cases I add "Mildex."

To me, it is important that roses be kept ornamental. I do not want dust applied when the foliage is wet so that

it remains in unsightly blotches. I do not want a spray that leaves conspicuous residue on either foliage or bloom.

I see little virtue in the various miracle gadgets now on the market. Rather than making life easier, many are very difficult to operate after the first week or two. Instead of investing $1.50 or more for eight ounces of dust in a plastic squeeze-duster, I think it much cheaper and far less time-consuming to invest $9.85 in a small rotary duster, very light and easy to use, and to buy dust in such quantities that the cost is nearer a dollar a pound than three dollars. The little "bombs" are good for spot treatment but several of those sent me for testing this year are gummed up so that nothing comes out. I have not personally used the various hose attachments, because I do not have time to get a hose around my garden without wrecking the plants. I have been called in to diagnose injury where pesticides have been applied with the hose. Apparently with some chemicals there is a narrow difference between a safe and a phytotoxic dilution, and the proportioner is not always accurate enough to keep on the safe side under certain weather conditions.

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**FRENCH BOTANISTS** (from page 123)

derata to the herbarium of the Academy of Natural Sciences of Philadelphia; he sent a collection to the friend in France who gave him a commission when he (Durand) first came to the United States; and he presented a herbarium of medicinal plants to the College of Pharmacy of Philadelphia.

While on a visit to Europe in 1860, Durand formed the opinion that the herbarium of the Jardin des Plantes was deficient in species from North America. On his return to the United States, he devoted much of his time to preparing a collection for that institution. He took the major portion to Paris in 1868 and conveyed the balance by bequest. The total amounted to about fifteen thousand species and forms the Herbier Durand. His botanical library is deposited in the Academy of Natural Sciences in Philadelphia. Thomas Meehan, in his obituary of Durand, refers to Durand's diary. I have failed to find it. It is not in the library of the American Philosophical Society, or the Academy of Natural Sciences of Philadelphia nor in that of the Muséum National d'Histoire Naturelle.

Although so long a resident of the United States, Durand remained a Frenchman at heart. When Napoleon's nephew had medals struck for those who served under the Emperor, none was more happy to receive the bronze token than Durand.

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# BOOK REVIEWS

**THE RIVER OF LIFE. Rutherford Platt. 309 pages, illustrated (drawings by Bernarda Bryson); indexed. Simon & Schuster, New York. 1956. $5**

Mr. Platt, through his keen powers of perception and more so through his ability to tell in a few words precisely what he has observed, weaves a basic philosophy of nature that has rarely been seen.

In *The River of Life*, each subject, with which we readers may have been slightly acquainted, is vibrantly presented through a modicum of similarity with our own being.

That the ninety-two elements, along with the strange power of protoplasm, could combine so miraculously into the endless and unabated fantasy of combination in plants and in animals, comes home with terrific impact.

Is Man the perfect product that can be formed by protoplasm? Have his senses been perfected? How good is his method of finding and assimilating food? What of his ability to reproduce? In *The River of Life* it becomes powerfully evident that we (humans) are but an infinitesimal part of a Great Plan. With increasing reverence, bordering on the sublime, we learn of refinements in other beings far beyond our power to imagine. Not in every sense or every implement of life in any single body, but rather in individuals possessing perhaps single talents of such great development that they are enabled to fill their niche in life with admirable efficiency. However, Nature seems never satisfied and is constantly making changes and improvements in her previous developments.

This reviewer has purposely avoided mentioning, by name, a single hero of this fine work. For, to approach *The River of Life* with even a taint of prejudice would be tantamount to diluting or losing the powerful "Philtre" of Nature which so gently permeates its pages.

FRANCIS A. ALLEY
*Landscape Architect*
*Short Hills, N. J.*

**USING WAYSIDE PLANTS. Nelson Coon. 254 pages, illustrated, indexed. Published by the author at Perkins Institution, Box 287, Watertown 72, Mass. 1957. $3**

Though this careful, imaginative, and interesting book has been designed and published by the author, it is fair to predict that one of the large publishers will be asking for a revised edition and the Audubon Book Club might well choose it for a spring selection. It fills a real need and deserves a wide audience.

Boy and Girl Scout Leaders and every one who loves the out-of-doors will rejoice in its practical recipes and suggestions for using one hundred weeds and wild plants. The plants themselves are clearly described in language that is thoroughly readable without recourse to a glossary of botanical terms. Line drawings by the author and Miss Frances McGaw further clarify the identification, with shaded maps showing in what region of the northeastern states each species may be found. Equally charming and helpful are the eight larger prints of plants in their natural habitats, such as those found near the shore.

The chapters on "Plant Crafts," "Dyeing with Roadside Plants," and "Remedies on the Roadside" are pleasantly specific with knowledge based largely on actual experience. "Observations on Food Plants" is a section devoted to recipes for preparing edible wild plants in such a way as to make them palatable for the dinner table instead of just emergency campfire fare. This is important because the way in which dandelion, sorrel, and other spring greens are cooked can make the difference between their being a welcome addition to the menu or merely "country messes."

Fern fronds, called corsiers by botanists, for instance, are good enough to put up as frozen foods along with asparagus for winter meals, if freed first of their fuzzy coating. If they are eaten without taking this precaution, they can cause illness. At least that was the sad experience of one Boy Scout Troop taken on a survival encampment without a foundation of knowledge such as is found in this book.

The author closes the book with a chapter on poisonous plants which he says might be read first, though most of the green plants he recommends as food would not be easily confused with dangerous ones. An excellent bibliography reveals the great amount of research which went into the book to back up his own empirical knowledge of wayside plants. In suggesting that every person who can reach the country arm himself with information on plant uses, the author is no extremist from the food or conservation points-of-view. He feels that knowledge is wealth and our road banks can yield compound interest.

As Librarian of the Perkins School for the Blind, Mr. Coon has many opportunities to use his gift for teaching while conducting classes in gardening at the school and for adult groups. His writings include books on the plant nursery business based on his previous endeavors along that line, a monograph on THE TACTUAL MUSEUM IN THE EDUCATION OF THE BLIND, and articles on gardening published by magazines. He is curator of the Natural History Museum at Perkins and has developed many hobbies over the years, including plant collecting, painting, printing, and collecting books on botany and garden history. The book's design and decoration show his artistic ability just as the text suggests that writing it was a labor of love. We hope that it will become a field guide and handbook to every amateur botanist and herbalist, for in limiting his choice to one hundred useful plants, Mr. Coon has challenged the reader to know much more about most of them than he ever did before.

GERTRUDE B. FOSTER
*Falls Village, Conn.*

**LIVING OFF THE COUNTRY. Bradford Angier. 241 pages, illustrated by Vena Angier. The Stackpole Company, Harrisburg, Pa. 1956. $5**

It is difficult to imagine a book on this subject more packed with information than this one! Furthermore, most of the information is both authoritative and useful, a rather marked distinction among books of this sort. The style of writing is such that any camper or would-be camper will find it fascinating reading on long winter evenings, and it will then surely become as much a part of his camp gear as his bed roll. To millions of city dwellers, who might in event of enemy attack be forced to take shelter in unsettled areas, this little book could easily determine whether they survived.

Sketches by the author's wife illustrate the contents of such chapters as: "Every Necessity is Free;" "Yours For The Eating;" "No Dishes to Wash;" "Thirst;" "Facts of Lighting Fires;" "Wilderness Homes;" "Staying Found;" "Camping and Signaling;" "Backwoods Medicine;" and "Survival Kit." In the chapters on foods, for example, the number of edibles in the forest is absolutely astounding, for we find that not only may berries, roots, and certain herbs be used, but just as useful are the inner barks of several birches, poplar, lodgepole pine, the stems and leaves of nettles and horsetails, and many of the lichens so common in the northeastern states—to name only a few.

The author helps the reader construct traps for animals of all sorts, advises him against wasting blood of any animal (it is unusually rich in vitamins and minerals), suggests that emergency conditions may make attractive even the sea-cucumber, the sea-urchin, and snails. The lack of proper fishing equipment need not be taken too seriously, for line, hooks and lures are all easily within the grasp of the stranded traveler; designs for traps, spears, gigs, are also described and should all these tools fail to produce the desired results, the author tells of his own experiences at catching fish with his bare hands. He answers such questions as: What sort of a firearm is best for general use in the backwoods? What should the survival kit and first aid kit contain? How can you distinguish poisonous mushrooms (answer, — don't try, the gain is not worth the tremendous risk!) ? How can I signal airborne rescuers that medical attention is needed, or that all is well? With no vindictiveness Mr. Angier effectively debunks a host of false, misleading, and downright dangerous ideas about life in the out of doors.

On the debit side, it must be said that the scope of the book is rather restricted geographically; this is not surprising, since the author (apparently) has based his writing on considerable personal experience in the forests of the northeastern states. From a botanical and practical point of view, the drawings of most of the plants are next to worthless; if they were intended to enable the reader to identify edible and poisonous plants in the field, they should have been much more carefully executed. Finally, the usefulness of the volume could have been greatly increased by a thorough-going index. Aside from these relatively minor objections, however, it is an excellent, unusually worthwhile book for campers, scouts of all ages and genders, and anyone else interested in survival in emergencies.

RICHARD S. COWAN, *Assoc. Curator*
*Div. of Phanerogams*
*U.S. National Museum*
*Smithsonian Institution*

**YOUR FLORIDA GARDEN. John V. Watkins and Herbert S. Wolfe. 349 pages, illustrated (drawings by Esther Coogle); indexed. University of Florida Press, Gainesville. Revised edition 1956. $5.50**

This much-needed book on Florida horticulture, especially now when so many garden-minded people are flocking into this

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state, should prove a tremendous help. It is written so that it can be easily understood by the average person, and illustrates many of the trials and tribulations one experiences when coming from northern localities to start gardening in Florida. When I say begin, it is really just that, for the new home owner starts with a home on a sand lot without tree or grass; and to the many who have never observed Florida methods, it is an exceedingly complex undertaking.

Fertilization is very well explained, and I cannot emphasize its importance too strongly. Compost, peatmoss or similar matter must be worked into the land frequently and a continual fertilizing program followed the year through. I might add that it is advisable to have the soil tested, in order to know the correct fertilizers to apply; also that the application of nitrogen must be reduced in the fall, as it tends to encourage young wood at a time when cold winds and frost may occur.

Many people think of Florida as a tropical or sub-tropical state, but this is not so. There are areas where, in some winters, garden vegetables and citrus trees are not safe. It is necessary to cover them or to use smug pots. Even then they may freeze or suffer so much from the cold that they will succumb later. Annuals and perennials, trees, palms mentioned in YOUR FLORIDA GARDEN for different parts of Florida are not entirely hardy all the time. Some seasons they will grow and be all anyone could wish for; another season, the very same plant will not respond to the same care or a change in weather conditions may displease it. Grow them, of course, but be prepared to be disappointed now and then.

The more tropical palms and fruits must be planted in sheltered positions. When established, they usually stand the cold spells better—and once acclimatized, they are a joy to those who have them. YOUR FLORIDA GARDEN can serve as a guide to those who are now gardening and to those who expect to do so. It contains a wealth of valuable information.

HERBERT W. TICKNER
*Kissimmee, Florida*

**PLANT PROPAGATION AND GARDEN PRACTICE. R. C. M. Wright. 192 pages, illustrated, indexed. With preface by Dr. T. J. Walsh. Criterion Books, New York. 1956. $4.50**

In this modern age of science, when the emphasis seems to be on speed and more speed, production and greater production, it is indeed heart-warming to review such a book as PLANT PROPAGATION AND GARDEN PRACTICE. In it, Mr. Wright has traveled the middle of the road: not one that puts too much emphasis on the production of thousands and thousands of plants, many of which are a drug on the market, and not one that is only for beginners in the world of plant propagation. It is a book from which both the professional and the layman can learn a great deal.

Plant characteristics are discussed in such a manner that one understands and appreciates why a certain plant, or group of plants, is propagated in a certain way. The description of greenhouse facilities and equipment necessary to propagate plants is very thorough and complete.

Though some of the propagating structures mentioned are not used too often commercially in this country, they are not employed only because they are not considered commercially feasible. However, they will and do work very well for the home plant propagator. This latter statement is certainly emphasized by the repeated failure of some plant propagation devices in use in this country. The propagation of a certain plant depends upon the individual and his facilities and how these facilities can be exploited to their best advantage.

Throughout the entire book the author has explained and illustrated, with very fine plates, the propagation of plants, both ornamental and edible. For instance, under the heading "The Propagation of Trees and Shrubs," an alphabetical list, including *Abelia* to *Zenobia*, lists the best methods to employ for the propagation of these woody plants; whether they should be propagated from seeds, cuttings, or grafts.

Other very interesting chapters are "Multiplication of Alpines," "The Propagation of Herbaceous Perennials and Water Plants," "Increasing Bulbous Plants," and "How Popular Glasshouse Plants are Increased." The plants found under the preceding titles are listed alphabetically in each instance. In all cases, the procedure employed to increase these plants is direct and easily understood.

Mr. Wright's book can best be described by comparing it with his comment on the use of artificial substances for the rooting of woody plants. While these growth-regulating substances have proven to be helpful in the rooting of certain plants, some of them quite difficult to propagate, the fact still remains that they, along with many of the newer techniques in plant propagation, prove no substitute for the skill and attention associated with all aspects of propagation.

ROGER G. COGGESHALL
*Propagator*
*Arnold Arboretum*
*Jamaica Plain, Mass.*

**THE BOOK OF FLOWERING TREES AND SHRUBS. Stanley B. Whitehead. 244 pages, with 63 plates in color by Joan Lupton; indexed. Frederick Warne & Co. Ltd., New York. 1956. (Printed in Great Britain.) $3.50**

This pocket guide is intended for use in Britain, and so much of the material described is applicable to the gardens of northeastern America only to a limited extent, though all the flowering shrubs familiar in the latter region are included. As the book is intended for owners of gardens of moderate size, the larger flowering trees do not come within its scope.

The opening chapters are devoted to the use and placing of flowering shrubs in landscaping; to those suitable for different types of soil and exposures; to planting and propagation; and to the care, that is, pruning, mulching, fertilizing of established plants.

Much the greater part of the book contains brief descriptions of shrubs and trees. These are arranged in the alphabetic order of the genus to which they belong, though the main heading of each genus is by its common name, or by the generic name where there is no accepted common name. The botanical family to which the genus belongs is also given.

The text is interleaved with about two hundred and fifty colored illustrations, four to a page, of a flowering twig of one, occasionally more, species of each genus treated, and they are good and should be a very helpful aid to identification.

It is inevitable with books treating of plants intended for the more equable British climate that they include many which are suitable only for the milder portions of the American continent, that is, the southern and Gulf states and California. It is no less true, however, that many of the shrubs mentioned in this book can be grown outdoors only in the southwestern regions of England and Ireland, which have an almost Mediterranean climate.

Whitehead mentions newer varieties of some familiar shrubs of northeastern gardens which sound very interesting and would seem worthy of introduction for trial in this country.

J. H. BEALE
*Ridgefield, Conn.*

**BEDDING PLANTS. Roy Genders. 192 pages, illustrated, indexed. Charles T. Branford Co., Newton Centre, Mass. 1956. (Printed in Great Britain.) $3.50**

This is a book for the amateur gardener who has visited England during the summer and fall and would like to relive the days spent in parks and gardens, noting the various plants used to the best advantage in that climate.

The book tries to cover quite a wide field and in a number of instances the recommendations for a show of flowers would only mean disappointment if copied in the United States under our usual summer conditions.

Some of the subjects and illustrations are more suitable for public park displays and rather than calling them "bedding plants," I think "border plants" would be more appropriate. Many of the plants mentioned for bedding would be much happier in the herbaceous border, which is seldom seen in such perfection as in the British Isles.

Decidedly this is a book primarily for the British gardener, and though a good many of the plants discussed are grown well in this country and would be hard to replace in American flower gardens, I suggest getting professional advice on the merits of some of the plants listed at the end of this book, with which the enthusiastic amateur gardener may have had no previous experience.

ARTHUR W. KING
*Huntington, N. Y.*

**FABULOUS FARMER. The Story of Walter Knott and his Berry Farm. Roger Holmes and Paul Bailey. 184 pages, illustrations from the sketches of Paul von Klieben and Clarence Ellsworth. Westernlore Publishers, Los Angeles, Calif. 1956. $3**

This is indeed a "fantabulous" success story about a man who, in the early twenties, rose from an adobe hut in the desert to the owner of a famous berry

(Continued on page 138)

# *NEWS, NOTES and COMMENTS*

**Annual Meeting.** The annual meeting of The New York Botanical Garden was held in the Assembly Room of the Snuff Mill on May 16, attended by a representative gathering of members.

Arthur M. Anderson, Howard Bayne, Hon. Thomas C. Desmond, Dr. John M. Fogg, Jr., Berkeley Gaynor, Charles B. Harding, Clarence McK. Lewis, Henry de la Montagne, Henry Parish II, and Dr. William J. Robbins were elected to succeed themselves to the Board of Managers for a term of three years (class of 1960); and Mrs. Leighton H. Coleman, Mrs. Walter K. Earle, Mrs. Earl K. Williams, Mrs. John G. Winchester, Dr. Theodore Kazimiroff, and Langdon S. Simons were elected to membership in the Corporation. All the officers of the corporation were elected to succeed themselves for a term of one year.

Distinguished Service Awards were presented to Mrs. Hermann G. Place, Mrs. Donald B. Straus, and Henry F. du Pont—the citation accompanying Mrs. Place's award being read by Mrs. Harold I. Pratt, the citation for Mrs. Straus being read by Mrs. Charles Burlingham, and the citation for Mr. du Pont by Dr. Robbins.

*Angela Moore Place*

The daughter of an eminent diplomat and statesman, Angela Moore Place has shown similar qualities of tact, leadership, and judgment in the many offices which she has held. Her keen interest in horticulture has been used by many organizations. She served as president of The Garden Club of America and on its Board as well as on the Board of Directors of The Horticultural Society of New York, the Board of Managers of The New York Botanical Garden, the Advisory Council of the National Arboretum, and also as president of the Millbrook Garden Club. To The New York Botanical Garden, however, Mrs. Place is best known for her leadership of the Advisory Council, having been a member since 1949 and its chairman from December 13, 1950, until December 1, 1954.

As a further evidence of her versatility, Mrs. Place has taken a keen interest in the construction and equipment of the new Laboratory Building of The New York Botanical Garden. In fact, one of the laboratories has been equipped and named in honor of her late distinguished father, the Honorable John Bassett Moore.

*Elizabeth Allen Straus*

Elizabeth Allen Straus, in her quiet way, has made an outstanding contribution in placing her artistic abilities at the service of the Display Committee at The New York Botanical Garden. In co-operation with the Committee, she has completely reconstructed the public museum exhibits on the main floor of the Museum Building, adding greatly to the educational value of these exhibits and providing at the same time an effect of great artistic merit.

By thus recognizing her achievements, the Garden records its appreciation for this constructive civic activity, which exemplifies the ideals of public service for which The New York Botanical Garden stands.

*Henry Francis du Pont*

Henry Francis du Pont, a fabulous collector, has assembled and made available to the public "the largest and richest assembly of American decorative arts ever brought together." This marvelous collection of American antiques is housed in the 100-room mansion, formerly the home of Mr. du Pont, now a public museum under the name of the Henry Francis du Pont Winterthur Museum. Equally notable, however, are the famous gardens which surround the museum at Winterthur, with their outstanding collections of azaleas, rhododendrons, dogwoods, lilies, peonies, iris and other rare plant specimens. It is, therefore, more as a plantsman than as a collector that we honor him by this award. He has served The New York Botanical Garden with distinction as a member of its Board of Managers since June 1940, and as Chairman of the Horticultural Committee since January 1943; in the latter capacity he has been of incalculable aid with the general landscaping of the grounds and particularly helpful in the laying out of the rose garden and the lilac garden.

Mr. Harding presented his report as President, Dr. Robbins as Director, Mrs. John D. Beals as Chairman of the Advisory Council, and Mrs. John G. Winchester as Co-chairman, with Mrs. Fergus Reid, Jr., of the Volunteer Associates. These reports are in the hands of the printer and will be mailed to members of the Garden shortly.

### The President's News Letter

*Excerpts from the May Edition*

The Cactus House has been remodeled and replanted . . . The first steps in making the outdoor collection of plants more available to the public is under way with more than one hundred plants near the Conservatory numbered and fully described . . . The Montgomery Conifer Collection has been fully described in a booklet published May 15 . . .

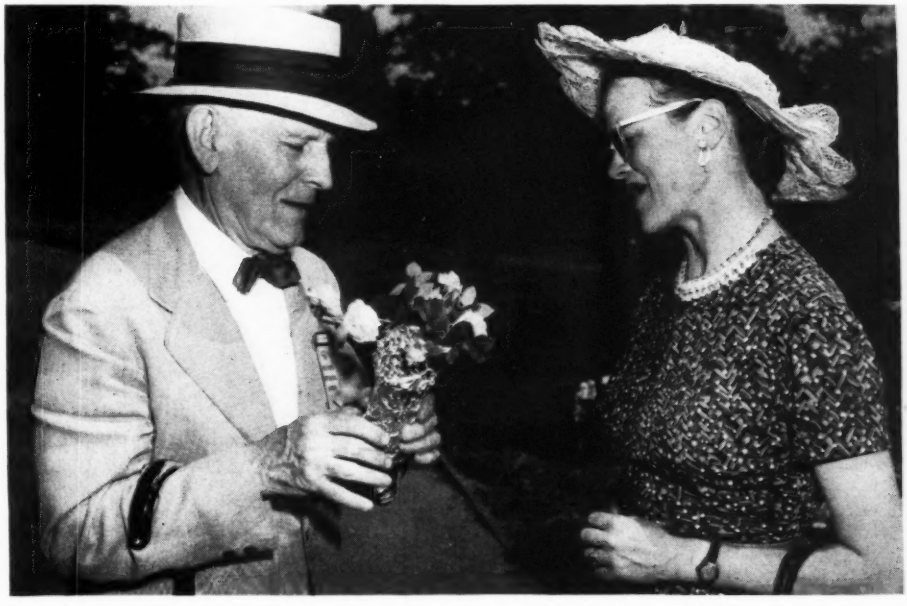
On May 4, John Kieran, noted naturalist, author, and lecturer, accompanied by E. J. Alexander of the Garden's staff, conducted a nature walk for Boy Scouts and Girl Scouts. On the same day, Dr. Theodore Kazimiroff, naturalist and Bronx historian, led the Bronx Historical Society through the Hemlock Forest . . .

College Alumnae from Vassar and Bryn Mawr were entertained at the Garden on May 15 by the Volunteer Associates . . . The American Rhododendron Society held its spring meeting and show in the Assembly Room of the Snuff Mill on May 18. The Assembly Room is being used for weddings, anniversaries, and private parties . . .

A. R. Teixeira, Director of the State Herbarium at Sao Paulo, Brazil, has arrived at the Garden for a year's study on pore fungi under a Guggenheim Fellowship . . . Dr. Donald P. Rogers has received a grant from the National Science Foundation for study and field work on a group of fungi in the Pacific Northwest . . . Dr. David D. Keck reports that the Herbarium has obtained two Fellows for graduate assistantships beginning July 1—William M. Keith, Jr., who has just received his Master's Degree from the University of Kansas (he will participate in the fall expedition to Venezuela), and T. M. Barkley who is taking his Master's at Oregon State University . . .

Dr. Bassett Maguire, while preparing for another expedition to South America, has been lecturing at Yale and at the Botanist Club of Washington, D. C. He reports that the Syracuse School of Forestry and the School of Forestry at Yale are participating in the forthcoming Venezuelan field trip. Dr. Maguire recently presented the color film history of his twelve years of exploration in South America to eleven major botanical institutions in England and Europe . . . Dr. John Wurdack has been invited to Belém by the Brazilian Government to join an expedition to one of the sandstone plateaus south of the Amazon River, to see if there are plant relationships between these mountains and the ones the Garden has been exploring in the Guayana Highlands . . .

Dr. P. P. Pirone is studying the effect of natural gas on trees and shrubs, and working with gibberellic acid, the new growth promoting substance, with which he has



Edwin De T. Bechtel, member of the Board of Managers of The New York Botanical Garden, who was one of the guest experts at the Fifteenth Annual Rose Day, identifies a rose for Mrs. John Sluder of Armonk, N. Y.

treated more than one hundred different kinds of plants and secured unusual growth responses . . . The Children's Plant Workshop and Flower Show conducted by T. H. Everett, in cooperation with volunteers of the Ninth District of the Federated Garden Clubs of New York State, was even a greater success this spring than last, with six hundred and seventy-five children registered . . . Under the supervision of the horticultural staff is the "Children's Gardens" in which about fifty children will grow vegetables in individual plots at the Garden . . . Vincent Rampino reports that three new facilities are being built: one, an "Orlyt" construction, will be used by Dr. Pirone for the study of plant diseases; the second for Mr. Everett's classes; and the third by Louis P. Politi as a propagation house . . .

*Excerpts from the June edition*

The American Rhododendron Society has promised a collection of the most outstanding new introductions to the Garden . . . the New York Cactus and Succulent Society will hold future meetings at the Garden . . .

On May 25, school children participating in "Gardencraft" planted tomatoes — and took home their first crop of radishes! . . .

Anwar Delmay, Keeper of the Herbarium Bogoriense, in Boger, Indonesia, visited the Garden on May 27. Mr. Delmay is touring American botanical institutions under a grant from Ford Foundation, and Dr. Keck assisted in setting up his itinerary in the United States . . .

Graduation exercises for about twenty students who have completed the Two-Year Course in Botany and the Two-Year Course in Practical Gardening, will take place on June 20; John H. Beale, for many years superintendent of the Arboretum at Boyce Thompson Institute, will be guest speaker . . .

Dr. P. P. Pirone has finished complete revision of Dodge and Rickett's "Diseases and Pests of Ornamental Plants;" as with earlier editions, Dr. Rickett helped in editing this widely-used reference book . . .


## BOTANY FOR GARDENERS

*by* HAROLD W. RICKETT, *Bibliographer*

**Dr. Rickett explains what makes plants grow so lucidly, in such poetic language, that gardeners will enjoy this book thoroughly for the better understanding they will gain about their plants—and for the sheer joy of reading a well-written book.**

**Price $4.50**

## THE MONTGOMERY CONIFER COLLECTION

*by* DOROTHY EBEL HANSELL, *Editor, The Garden Journal*

**Mrs. Hansell, with the assistance of E. J. Alexander, Associate Curator, Dr. Arthur Cronquist, Curator, T. H. Everett, Curator of Education and Horticulturist, Miss Elizabeth C. Hall, Librarian, and Louis P. Politi, Head Gardener, has prepared a non-technical description of the conifers comprising the Montgomery Conifer Collection at the Garden.**

**Illustrated Price 50c**

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10% Discount to Members

Mrs. Milton A. Hescock, well known for her lectures and classes in artistic arrangements, demonstrated how to arrange roses at the Fifteenth Annual Rose Day

Dr. Donald P. Rogers, who has been Curator in charge of cryptogams since 1947, will leave the Garden on September 1 to become professor of botany at the University of Illinois . . .

Mrs. Robert C. Lovett and Mrs. Harold Ruckman Mixsell, co-chairmen of the Volunteer Associates' Theater Benefit, have selected "The Music Man" and the date of January 8, 1958 . . .

The library recently received a magnificent two-volume quarto: "Mushrooms Russia History". Written by Gordon Wasson, former treasurer of the Garden, the book was published in limited edition of five hundred copies. Mr. Wasson set aside a certain number for distribution to important botanical institutions, and they were sent out with an engraved notice that "distribution" was being made by The New York Botanical Garden . . .

One hundred new members have been welcomed these past few weeks as a result of our membership appeal . . . lists of people to invite are needed . . . Mrs. Mildred Saffell in the Downtown Office is sending out the membership material . . .

**Garden Club of America Award to Dr. Robbins.** At the forty-fourth annual meeting of the Garden Club of America held in Chicago on May 21-24, 1957, the Eloise Payne Luquer medal was presented to Dr. William J. Robbins for medical research in the field of botany. His vision and persistence led to the building of the Research-Laboratory at The New York Botanical Garden, of which he has been the Director since 1937. It was erected as a place for study for biologists and chemists in order to attack the basic problems in plant development with the conviction of their bearing on the understanding of animals and man. His undisputed reputation for leadership was evidenced by his appointment as trustee of the Rockefeller Institute for Medical Research, as treasurer of the Academy of Sciences, and president of the American Philosophical Society, as a fellow of the Academy of Arts and Sciences and the American Association for the Advancement of Science. His name is known, not alone throughout the United States, but throughout the world, as one of the leading scientists not only in botany but in morphology and cytology.

Seven other distinguished leaders in conservation and horticulture were also honored by the Garden Club of America: the Medal of Achievement to Mrs. William A. Lockwood of the Garden Club of Easthampton, L. I., a former president of the Garden Club of America, for stimulating the love and knowledge of gardening among amateurs; the Gold Medal of Honor to Frederic Heutte of Norfolk, Va., for his extensive landscaping and planting of public areas; the Margaret Douglas Medal to Mrs. Leroy Clark of Englewood, N. J., for leadership in conservation education; the Amy Angell Collier Montague Medal to Mrs. Henry Dexter Sharpe of Providence, R. I., for her landscaping of Brown University, Pembroke College, and park in front of the court house; the Mrs. Oakleigh Thorne Medal to Sylvia Shaw Judson for her garden sculpture; the Katharine Thomas Cary Memorial Medal to Mrs. Tomoko Yamamoto of San Francisco for her contributions as artist and teacher in flower arrangement (the title of Flower Master and Master of Tea Ceremonies, previously only awarded to men, was conferred upon her by the Emperor of Japan in 1906); the Distinguished Service Medal to Mrs. Stanley M. Rowe for research in botany and horticulture and her arboretum near Cincinnati, Ohio, which has assisted many students and gardeners.

**Daylilies — and Dr. Stout.** In looking through the pages of the Hemerocallis Journal 1957 Yearbook issue, it was interesting to note that Dr. Stout's 'Dauntless' was awarded the Stout medal by the American Hemerocallis Society in 1954 and that three other varieties of his breeding received awards of merit from the Society in these years: 1954 'Blanche Hooker,' 1953 'Rose Gem,' 1952 'Dominion,' and 'Georgia,' 1951 'Bertram Farr,' 'Cabellero,' and 'Dauntless,' 1950 'Patricia.' 'Dauntless,' 'Georgia,' 'Cabellero,' 'Taruga,' and 'Ming' are on the A.H.S. 1956 Popularity Poll.

On page 16 of this 1957 Yearbook issue of the Hemerocallis Journal there is an article, "Daylilies—A Look Beyond Today" by Mrs. Bright Taylor. In the first paragraph Mrs. Taylor writes: "Daylilies have come a long way since they were first noticed by the Swedish botanist Linnaeus in 1762—and most of the progress has been made in the last thirty years when Dr. A. B. Stout, then at The New York Botanical Garden, began to work with them. His scientific mind was intrigued by the fact that *Hemerocallis fulva* set no seed although it lined the roadways. To find out why he began experimenting with it and other species known at that time. He developed garden types that are still standard for us today—in fact, one of them, 'Dauntless,' won the Stout medal in 1954 which, at the present time, is the highest honor a daylily can receive."

Dr. Stout was honored by the American Hemerocallis Society in 1950 with the Bertram Farr award given for outstanding work in hybridizing hemerocallis.

**Bronx Women's Auxiliary of The New York Botanical Garden.** At a tea in the Assembly Room of the Snuff Mill on June 4, 1957, more than one hundred women became acquainted with the youth program at the Garden. A. C. Pfander, Administrator, explained what had been accomplished thus far for young people—the hobby club, nature walks, plant workshop, flower shows, and the garden plots allotted to and worked by fifty children for the first time this spring—and how the Garden hopes to ex-

"Fieldston Hill," the residence of Mr. and Mrs. Edward C. Delafield at Riverdale, has a magnificent view of the Hudson River from the brow of the hill just above the formal rose garden. This garden was designed by the late Herman W. Merkel, chief forester and constructor of New York Zoological Park. Fine plantings have been made to emphasize the natural rock outcrop, and there are many beautiful trees more than one hundred years old—white pine, tulip-tree, Franklinia tree, the fastigiate form of the gingko, English hawthorn, Sargent's crab-apple, dogwood, and the dawn redwood—the latter introduced to cultivation through the efforts of the late Dr. Elmer D. Merrill, a former director of The New York Botanical Garden.

"Fieldston Hill," consisting of twenty-two acres, is part of the property acquired by Mr. Delafield's grandfather in 1829; the dwelling, of a more recent era, was built in 1905.

pand the program to include more young people.

"No radishes purchased at the corner grocery ever tasted as good as the radishes pulled from these plots on May 25," Mr. Pfander said, and the expression on the faces of his audience indicated they wholeheartedly agreed with him. He appealed, as did Mrs. Theodore Kazimiroff and Mrs. Lee Lang, for cooperation in putting on a rummage sale this fall, the proceeds to be applied to the youth program. Mr. Pfander told the Bronx residents of the very successful annual rummage sale which several women's organizations in Cleveland hold annually for the benefit of the Cleveland Garden Center. Fifty thousand dollars are raised in this way.

Mrs. Ann Lee Jacobs, Public Relations Director of the Washington Heights Federal Savings and Loan Association, served as chairman of the tea.

**The Garden's Seed Exchange.** Dr. William J. Robbins, Director of The New York Botanical Garden, received this delightful letter in appreciation of the Garden's seed exchange: "Don't you think its time I stopped scratching in the soil? Well, you are to blame. As long as you send the list of seeds I shall be plaguing you, so perhaps you had better see that I don't get the seed list next year or I shall be troubling you again.

"Dr. Robbins, I thank you for your many kindnesses in sending me seeds for so many years. It has given me great pleasure to plant them and watch their development. Now, even at the age of eighty-seven, I am still very much interested although I do have to go more slowly . . ." Kate Perinchief, Somerset Bridge, Bermuda.

**Spring 1957 Garden Tour.** The Garden Tour, sponsored by the Volunteer Associates of The New York Botanical Garden, was a very successful event in every respect—beautiful gardens (see illustrations pages 137, 138 and 139), ideal weather, fine attendance, and arrangements well managed.

Serving on the Spring Garden Tour Committee were Mrs. Percy L. Douglas and Mrs. Herman D. Ruhm, Jr., co-chairmen, Mrs. Willcox B. Adsit, Mrs. James Cox Brady, Mrs. Edward C. Delafield, Mrs. C. Soutter Edgar, Mrs. Marcus Fair, Mrs. John E. Lockwood, Mrs. Charles G. Proffitt, Mrs. Fergus Reid, Jr., Mrs. David Rockefeller, Mrs. S. Harrison Rollinson, Mrs. Giles Whiting, Mrs. John G. Winchester.

Staff Consultants and Horticultural Experts included T. H. Everett, Curator of Education and Horticulturist of The New York Botanical Garden, Thomas Clark, Head Gardener of the David Rockefeller Estate, Eugene J. Detmer, Jr., of Detmer Arboretum and Nursery, Miss Elizabeth C. Hall, Librarian of the Garden, Dr. P. P. Pirone, Plant Pathologist of the Garden, William Poetain, superintendent of the Mrs. Giles Whiting Estate, Mrs. Evelyn Swanson, Supervisor of Gardens, Sleepy Hollow Restoration, and Howard W. Swift, Assistant to the Curator of Education and Horticulturist.

**Dr. B. O. Dodge** was fully retired by action of the Executive Board of the Board of Managers of The New York Botanical Garden, on April 18, 1957, at his request—the date of his eighty-fifth birthday. Dr. Dodge has completed twenty-nine years of service with The New York Botanical Garden. In January 1947, he became Plant Pathologist Emeritus and was retained in the capacity of consultant for projects on microbiology.

**Arno H. Nehrling honored.** In recognition of a lifetime devoted to the cause of American horticulture, Arno H. Nehrling was honored with the Arthur Hoyt Scott Garden and Horticultural Award at Swarthmore College commencement exercises June 10, 1957. The Award, which consists of a gold medal and prize of one thousand dollars, was presented to Mr. Nehrling by Dr. Courtney Smith, President of Swarthmore College and Chairman of the Committee of Selection for the Scott Award. The twenty-eight year old Scott Award was established by Margaret Scott Moon and Owen Moon, Jr., in memory of Arthur Hoyt Scott, an outstanding amateur gardener.

As a professor of floriculture, Mr. Nehrling taught at the University of Illinois,

The front entrance to "Hudson Pines," the Georgian brick residence of Mr. and Mrs. David Rockefeller, beautifully situated in Pocantico Hills near Irvington, N. Y., with a commanding view on the rear side across a sweeping lawn of the hills and the Hudson River far below. Groups of tall hemlocks, pines, and *Cryptomeria japonica* and flowering trees grace the grounds, landscaped by Robert L. Fowler. The garden area has been cleverly designed for maximum production with easiest maintenance. The center flower beds are for cutting, and the sloping beds backed by shrubbery are arranged as decorative borders.

A wealth of trees and shrubs from many corners of the world have been attractively planted in a natural setting of broad lawns and rolling hills at "Detmer Arboretum," Tarrytown, N. Y. The one hundred and twenty-five acres were landscaped by Julian F. Detmer who resides in the Rhine-like castle overlooking the Hudson River. In the notable plant collection are dwarf forms of *Picea Abies*, a fastigiate form of the white pine, Sargent's weeping hemlock, magnificent English yews (rarely are such fine specimens seen near New York City), a superb tall *Cedrus atlantica glauca*, the lovely honey locust which is one of the best shade trees, very finely cut-leaved forms of the Japanese maple, the dwarf variety of the Swiss Mountain pine which is a hardy low-growing conifer for well-drained soil and a sunny situation.

Massachusetts Agricultural College (now University of Massachusetts), and Cornell University. As a business man in both the retail and wholesale florist industry, he worked to raise the industry standards. He has served as an officer in a number of the leading commercial, professional, and amateur horticultural organizations and is the author of many authoritative articles. His work as Executive Secretary and Director of Publications and Exhibitions of the Massachusetts Horticultural Society has helped to make this one of the largest and most influential horticultural organizations in the country.

**Fellowships in Conservation.** The National Wildlife Federation announces its 1958-59 fellowships in conservation: undergraduate student $500, graduate student $1,000, and post graduate or special student $1,000. These fellowships are available to qualified individuals working in the field of conservation or conservation education. Further information and application blanks may be obtained from Ernest Swift, Director, National Wildlife Federation, 232 Carroll St., N.W., Washington 12, D.C.

**American Rose Society** held its annual spring convention and show in Milwaukee, Wisconsin, June 20-22. Among the talks by distinguished speakers on the program were "Fungicides and Soil Fumigants," by Prof. Earl K. Wade, Extension Pathologist of the University of Wisconsin; "Floribundas Today and Tomorrow" by Eugene Boerner, hybridizer with Jackson & Perkins Co.; "Our Changing Gardens," by Mrs. May T. Watts, staff naturalist of Morton Arboretum; "Rose Culture and Winter Protection" by Dr. and Mrs. Leo Cogan of Milwaukee, Wisc. Glimpses of roses in Europe were presented by Charles W. Gregory, managing director of C. Gregory and Sons, Ltd., Nottingham, England, and Jean Gaujard, owner of the century-old Roseraies Pirnet-Duchet, Feyzin, Isere, France.

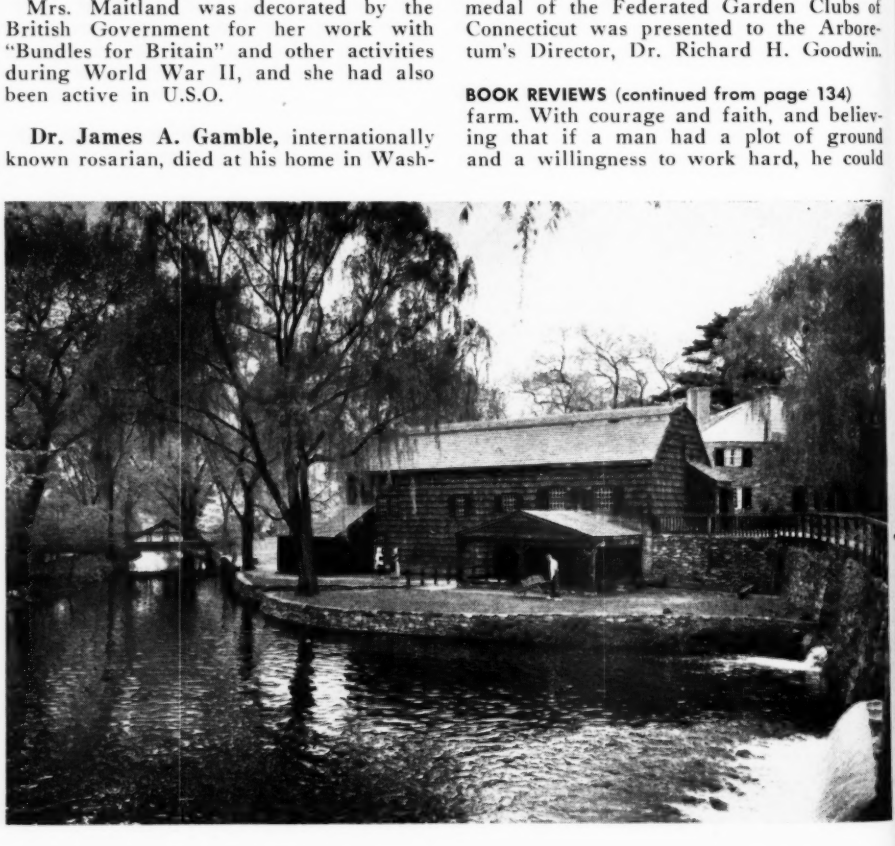
**Mrs. James Maitland,** member of the Volunteer Associates of The New York Botanical Garden, died at her home in New York City on May 8, 1957, at the age of fifty-nine. She is survived by her husband, a son, Henry Mellen, four daughters, Mrs. Seton Ijams, Mrs. Martin Horner, Mrs. Robert Corron, and Mrs. Howard Dean; and two brothers, Gardiner Wigglesworth of England and Beldin Wigglesworth of Washington.

Mrs. Maitland was decorated by the British Government for her work with "Bundles for Britain" and other activities during World War II, and she had also been active in U.S.O.

**Dr. James A. Gamble,** internationally known rosarian, died at his home in Washington, D.C., on April 19, 1957, at the age of seventy-four, after a long illness. A native of Thompsonville, Conn., Dr. Gamble was active in the dairy industry until his retirement in 1948, and was a founder and associate editor of the Journal of Dairy Science. He was a long-time member of the American Rose Society, a director of the American Rose Foundation to which he had contributed one thousand dollars annually to support basic research on rose fragrance, a past president of the Potomac Rose Society, and author of the book ROSES UNLIMITED, published in 1950.

**Edna Fisher Edgerton Memorial Wild Flower Garden** will be established at the Connecticut Arboretum in New London, Conn., by a gift of five hundred dollars to the Arboretum from the Federated Garden Clubs of Connecticut, in honor of the late Mrs. Edgerton, one of the early presidents of the Federation and one who was deeply concerned with conservation. The bronze medal of the Federated Garden Clubs of Connecticut was presented to the Arboretum's Director, Dr. Richard H. Goodwin.

**BOOK REVIEWS** (continued from page 134)
farm. With courage and faith, and believing that if a man had a plot of ground and a willingness to work hard, he could



The old grinding mill on the grounds of Philipse Castle with the manor house at the far right. The stone part of the house dates from 1683 and was built by Frederick Philipse; the frame wing was added in 1785 by Gerard Beekman. These buildings are included in the Sleepy Hollow Restoration on the Tappen Zee, Tarrytown, N. Y., in a picturesque setting. This fine restoration reflects the Dutch influence that prevailed in the seventeenth and eighteenth centuries along the Hudson River Valley.

An attractive path near the unheated greenhouse in the garden of Mr. and Mrs. Willcox B. Adsit, "Laurel Hill," at Ardsley, N. Y. Clumps of perennials fill the border on either side of the path; the gate invites one to explore further into the garden beyond.

(Photos and captions on this page by T. H. Everett, Curator of Education and Horticulturist of The New York Botanical Garden).

make a living from the good earth, he fought discouragements until success finally came.

Struggling through the depression years with his tireless and thrifty wife, who turned surplus berries into tasty pies, he was suddenly rewarded with the finding of the long lost bosenberry. After three years, he unselfishly made the plants available to other growers.

How the Knotts and their four children developed the ten acres of berries into hundreds of acres of restaurants and a wild west "Ghost Town" is an exciting story well written. It is so unbelievable that every year a million people travel there to see it with their own eyes. Mr. and Mrs. Knott are still alive and enjoying the fruits of their labor.

OLIVE M. GUNNISON
*Quaker Acres*
*Pawling, N. Y.*

**SOIL FERTILITY AND FERTILIZERS.** Samuel L. Tisdale and Werner L. Nelson. 430 pages, illustrated, indexed. Macmillan, New York. 1956. $7.75

This book is one of the most recent and finest that has yet been published in the field of soil fertility and fertilizers and although pointed towards college students in agriculture will prove to be a valuable reference book for the advanced gardener, nurseryman, greenhouse technician, and others.

There is a brief historical introduction and then six chapters concerned with the essential elements for plant growth, plant nutrition and the soil factors which influence their availability. The next five chapters deal with the properties, manufacture and value of commercial fertilizers with some emphasis on new and higher analysis materials. The remaining seven chapters are concerned with the principles of soil fertility, methods of soil fertility evaluation and the economics of proper fertilizer usage.

The authors have assembled a wide range of illustrative material which supplements the text and adds emphasis to the basic concepts of soil chemistry and fertility. The authors have indicated in the preface that they were attempting to effect a balance between the theoretical and applied phases of the field in order that those who "practice the art" may acquire a better understanding of the soil fertility and fertilizer complex with which they work. This objective has been admirably accomplished in the text.

W. P. MARTIN
*Department of Soils*
*University of Minnesota*

**SOYBEANS FOR HEALTH, LONGEVITY, AND ECONOMY.** Philip S. Chen. 241 pages, illustrated, indexed. The Chemical Elements, South Lancaster, Mass. 1956. $3

Philip S. Chen has presented an outstanding case for wider use of the soybean and soybean products in human nutrition. His approach is interesting and logical, written in non-technical language for the general American public and for the American housewife in particular. He combines the wisdom of the Orient with the results of modern American research in showing that the soybean is one of our best available foods, considered both from the viewpoint of the nutritionist and from the view-

(Continued on page 140)

The Christmas Rose, *Helleborus niger*, is a choice garden plant. In the garden of Mr. and Mrs. Willcox B. Adsit it has made itself so much at home that self-sown seedlings spring up in abundance beneath the parent plants. Shade and a fairly moist soil are needed for the best success with *Helleborus*.

*Iris cristata* blooms freely in a partially shaded location. This very lovely species is a native of eastern North America and is a fine garden plant.

The Golden-Star, *Chrysogonum virginianum*, thrives in the crevices of steps in full sun. This native of eastern North America is not used in gardens to the extent that its very real merits deserve. It bears its golden-yellow flowers throughout the summer.

## LET THERE BE HERBS

Since we prefer to take the dictionary's second definition of the word "herb," "a plant valued for its medicinal properties, flavor, scent, or the like," forgetting the previous reference to "a flowering plant whose stem above ground does not become woody and persistent," it seems perfectly fair to include recipes for the fruit of flowering shrubs under our column heading.

Fair or not fair, we want to share with you our excitement at discovering that you can make jelly from the fruit of the commonly called Japanese flowering quince, *Chaenomeles lagenaria*. In a recent "Gardeners' Chronicle and Gardening Illustrated," there is an article about the changes of genus which this plant has endured at the hands of taxonomists, and the resulting confusion gives us temerity to add it to the herb list without blushing.

Actually, we shouldn't have been so surprised to find that it had edible fruits when we realize that it is a member of the Rose Family. But it was news to learn that it is so rich a source of pectin that a few of the fruits can be added to jellies, such as elderberry, which are hard to jell without resort to commercial bottled pectin.

One of our subscribers, who makes a hobby of modifying old-time recipes for liqueurs to every day kitchen use, has sent us his notes on japonica "apples" as he calls them. It seems that they have been used in his family for generations of southern living. The acid flavor of the fruit perks up juices of bland berries which would otherwise be quite useless for jelly, due to their lack of pectin. Herb jellies made from an infusion of the fresh herb leaves in boiling water benefit by the addition of japonica pectin. To prepare the fruit of the flowering quince is the first order of business.

### Japonica Apple Jelly

Cut up the whole fruits when ripe, removing any flaws, cover with water and cook in a pressure cooker for ten to fifteen minutes. Cool and release pressure. If boiled in an open pot much of the delicate, volatile flavor of the fruit is lost. The juice is strained or squeezed from the pulp and used in the following proportions: one and one quarter cup of sugar to one cup juice. If boiled for one to two minutes, the jelly stage is reached. By the addition of one half cup of herb infusion made from a good-sized bunch of tarragon or other herb steeped in boiling water for fifteen minutes, an herb-flavored jelly is produced. The pectin content of the japonica fruit is sufficient to absorb the extra liquid without losing its jellying property. Essential oils of herbs, fruits, or spices may be used for flavoring also, and usually in such cases vegetable colorings are added. If four cups of quince juice and five cups of sugar are used, you will produce six to eight glasses of jelly.

### Wine Jelly

3 cups japonica jelly extract
4 cups sugar

Cook until ready to jell; then add one cup plus two tablespoons claret, two tablespoons rum, and four drops of vanilla extract. Skim and pour into glasses. It will make six to eight jelly glasses of eight ounce size. This jelly will tend to "weep" after two years standing; but if used fairly quickly, it is very nice. The vanilla blends and rounds out the apple, rum and wine flavors and is quite necessary for a properly flavored jelly.

GEORGE C. GROSS

### Wild Rose Jam

Rose hips have taken on a new importance since the discovery of their high vitamin C content. Any fruits of the rose may be used but those of *Rosa rugosa* are large and easily available, as the plant grows wild in many parts of the country. They are best gathered after the first frost.

To every pound of hips, add one half pint water, and boil until the fruit is tender. Strain through a fine sieve to remove seeds and rough interiors of the fruit. Add sugar in equal parts by weight and boil until mixture jells. Use an enameled saucepan for boiling.

NELSON COON in USING WAYSIDE PLANTS

GERTRUDE B. FOSTER

**BOOK REVIEWS** (from page 139)

point of the economist.

The author develops his subject under four parts: (1) Nutritive Value of the Soybean, (2) Soy Products, (3) Soybean Culture and Preservation, and (4) Recipes. Each part is illustrated and results are summarized in simple, readable form. It is often difficult to take technical data and present them in popular language for public consumption. The author does a good job with his problem.

The American housewife who likes to cook, and who also strives to see that her family is well-fed, will be delighted with the very complete and practical recipes for using soybeans and soybean products. Many would say that the book is a success from the standpoint of the soybean recipes alone.

All of us are interested in living long, healthy lives, and most of us are economy minded. So the majority of us would enjoy reading this very complete case for the soybean as written by Dr. Chen. Some may say that Dr. Chen's conclusions paint too bright a picture for the soybean, but history proves his points and present-day trends justify his enthusiasm.

HUGH A. WOODLE, *Leader*
*Agronomy Extension Work*
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**THE WORLD FERTILIZER ECONOMY.** Mirko Lamer. 715 pages, indexed. Stanford University Press, Stanford, Calif. 1957. $12.50

The Food Research Institute of Stanford University is developing a series of studies on world food and agriculture of which this volume is the latest. The author covers the entire field of fertilizer economy, including world production, trade, and consumption of the several fertilizer constituents and materials. War-time patterns of belligerent countries is emphasized. The various trade units, such as the British Dominions, North Africa, The Levant, Europe, The Soviet Union, The Far East, and Latin America are covered in detail. Two chapters are devoted to the Soviet Union, one dealing with fertilizer resources and the other with fertilizer use. The chapter on the United States gives fertilizer allocations for the various crops, degree of replacement of soil nutrients, and regional distribution of fertilizer use. The last four chapters deal with wartime prices, supplies, demand, trusts, cartels and probable developments ahead. Unfortunately, the sixty-four tables of data that are appended, as well as most of those interspersed throughout the text, cover the situation only up to 1945. The primary purpose of the author is to show what happened to fertilizer economy during World War II. He is impressed with the need to build up the fertilizer industries of the densely populated countries rather than to rely on exchange of products for food grains or on gifts of food from the nations that are troubled with surpluses. The general theme is well developed, and the thirty-two chapters are well documented.

FIRMAN E. BEAR, *Editor*
*Soil Science*
*Rutgers University*
*New Brunswick, N. J.*

**CHROMOSOME BOTANY.** C. D. Darlington. 186 pages, illustrated, indexed. Macmillan, New York. 1956. (Printed in Great Britain.) $2.75

C. D. Darlington has at times—and with reason—been charged with reaching wrong conclusions on the basis of inadequate data. Evidence for such accusation can be found in CHROMOSOME BOTANY: they who wish could justifiably ask for further details for certain statements. But they would worry themselves needlessly. That facts be given meaning and that the whole story be told seem to be the important things even if, in instances, the facts are misinterpreted or in minor ways the story is not true. I have long admired Darlington for his ability to tell the story; here he is superb. His writings are in consequence both stimulating and irritating: perhaps these are but a single state of excitement.

This is a small book, with the avowed purpose of bringing "our knowledge of wild and cultivated plants, our knowledge of systematics and ecology into one focus." My opinion is that for so brief an account the end has been achieved to a remarkable degree. Surprise comes not at the classical references omitted but at the casual ones included to bolster an hypothesis of the moment. An appendix by E. B. Ford states that the principles developed in the book "are clearly applicable to animals as well as to plants."

Darlington is unduly critical of the systematists. I think that they have done an excellent job of recognizing patterns of evolution in spite of the limitations under which they have had to work. Though Darlington's criticisms are strong and frequently immoderate, this is hardly sufficient ground for the hurt feelings of one systematist who concludes "that, in the main, the publication of this book has seriously damaged the scientific standing of evolutionary studies." On the contrary, my prediction is that as in the past Darlington's statements will stimulate other workers to think. The book is thus a most valuable one.

J. T. BALDWIN, JR.
*College of William and Mary*
*Williamsburg, Va.*

**COMPOST FOR GARDEN PLOT OR THOUSAND-ACRE FARM.** F. H. Billington. (Revised by Ben Easey) 104 pages, indexed. Charles T. Branford, Newton Centre, Mass. 4th ed. 1956. (Printed in Great Britain) $2

The fourth edition of this book by the late F. H. Billington has been brought up to date by Ben Easey, himself an author of a text book on organic gardening. Mr. Easey transplanted several sections of the

book for better sequence of subject matter and added an index for quick reference.

**FUNDAMENTALS OF HORTICULTURE.** J. B. Edmond, A. M. Musser, F. S. Andrews. 456 pages, illustrated, indexed. McGraw-Hill Book Co., New York. Second edition 1957. $6.75

Changes in the second edition of this book, useful for junior and senior colleges and universities in the first or basic courses in horticulture, include bringing the text up to date, deleting some questions and adding others in the question and answer section at the end of each chapter, revising the section on citrus fruits and adding information on plant regulators in the apple orchard.

**THE BOOK OF PERENNIALS.** Alfred Carl Hottes. 272 pages, illustrated, indexed. Revised and brought up to date by E. L. D. Seymour. Dodd, Mead & Co., New York. 1956. $4

**HOW TO INCREASE PLANTS.** Alfred Carl Hottes. 279 pages, illustrated, indexed. With a supplement of latest developments by E. L. D. Seymour. Dodd, Mead & Co., New York. 1956. $3.50

These two books by the late Alfred C. Hottes have long been in demand because of their practical and instructive information. The first made its appearance in 1923 and its eighth edition, published in 1956, was revised and brought up to date by the late E. L. D. Seymour, himself an eminent horticulturist.

*How to Increase Plants*, first published in 1949 and revised by Mr. Hottes in 1952 made another appearance in 1956 with a supplement on the latest developments in plant propagation, also prepared by the late E. L. D. Seymour.

### "Geraniums for Home and Garden"

Since the publishing of Helen Krauss' book, GERANIUMS FOR HOME AND GARDEN, in the fall of 1955, a great deal of criticism has been written about it. Five years before this book was released, I had heard that Mrs. Krauss was working on the pelargonium-geraniums. Knowing she never does things by halves, I expected her book would fill the void for the much-needed up-to-date information on that subject. I knew her book would be full of authentic information. Having done a great deal of research work on the pelargonium-geranium names, I realized the almost fruitless attempt she was making to bring order out of the chaos existing in this family.

When the book was finally released I was delighted to find Mrs. Krauss had covered the entire subject in her usual, clear, concise, orderly fashion with descriptions of about one thousand different varieties. One does not have to wade through a lot of flowery language to get the information. Every one of the one hundred and ninety-four pages is filled with information, all in neat, numerical order. The book is divided into three parts; part 1 covers descriptions of the various groups and history of the *Pelargonium*. Mrs. Krauss has not wasted space to go into details in this section, as most of the information can be found in other books.

Part 2 covers the varieties and their descriptions. Since the introduction of pelargoniums from South Africa, the number of species and varieties which have been known and are now known would comprise far too many for Mrs. Krauss to list in any one volume. She has, therefore, made a fine selection of the different types which can be obtained in the United States today. These include the most popular of the newer varieties recently introduced. Many of these new varieties have already been lost to the trade as, at the time she was writing her book, they had not been sufficiently tried for endurance. I have made a search for some of the new geraniums she named, especially some of those in the Pelargonium-Hortorum group introduced by Mr. Arndt to whom she has given a great deal of credit for helping her with the book. I have many of Mr. Arndt's introductions, but the last time I visited his greenhouse I found he no longer carried many of those Mrs. Krauss mentioned. They may have been the best he produced when Mrs. Krauss was writing, but by the time the book was published, they had already been discarded in favor of better varieties. When I first visited Mr. Arndt's greenhouses four years ago, he actually had thousands of geranium seedlings on trial. Mr. Arndt had collected about every pelargonium-geranium available and Mrs. Krauss, living nearby, had ample opportunity to study them. It is easy to see why she was completely carried away with some of his then outstanding selections; but as he continued to produce newer and better varieties, others were discarded before they were introduced to the trade.

In addition to the Pelargonium-Hortorum group, Mrs. Krauss has covered the subject on the ivy-leaved geranium, *P. peltatum*, and the Lady Washington geranium, *P. domesticum*. She is up-to-date in her nomenclature on the scented-leaved geraniums. The names of many of these have been changed due to Dr. Moore's (of the Bailey Hortorium, Ithaca) extensive research. There are also changes of names in the rare and unusual pelargoniums which include most of the species.

Section 3 covers nicely the culture of pelargonium-geraniums — propagation, diseases, pests, and how to cope with them. The pages of illustrations, especially on the scented geraniums, are a wonderful help to the student studying this genus.

Mrs. Krauss has made some mistakes, and there have been objections to the changes of names, but I wish that all those who have held her book up for criticism would consult her as to where she obtained her information. It may surprise you, as it did me, when I asked her if she had not misspelled the name 'Shotesham Pet.' I was accustomed to spelling it 'Shottesham Pet.' She replied that 'Shotesham' was the original way it was spelled in the "Gardeners' Chronicle" when it was introduced.

MERRY ELLEN ROSS
*Merry Gardens*
*Camden, Maine*

**GERANIUMS FOR HOME AND GARDEN.** Helen K. Krauss. 194 pages, illustrated, indexed. Macmillan, New York. 1955. $5

## RECENT ACQUISITIONS TO THE LIBRARY

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